AIR POLLUTION CONTROL DISTRICT

CLEARING THE AIR

2019 APCD Workshop Series

Are you curious about the air you breathe, what's in it, and how it's protected?

Join us at our free monthly workshops and get an in-depth look at how we keep the air clean.

FEBRUARY 18	JULY 15
MARCH 18	AUGUST 19
APRIL 15	SEPTEMBER 16
MAY 20	OCTOBER 21
JUNE 17	NOVEMBER 18

6 p.m-7:30 p.m. | Louisville Free Public Library, 301 York St.

For more info, go to www.louisvilleky.gov/APCD

(502) 574-6000

CLEARING THE AIR

2019 APCD Workshop Series

AIR POLLUTION CONTROL DISTRICT

The **APCD Workshop Series** seeks to:

- Increase the community's understanding of Louisville's air and of APCD's many functions
- **EMPOWER** citizens
- Provide a more informal forum for dialogue, Q&A and feedback
- Continue with community engagement efforts

CLEARING THE AIR

2019 APCD Workshop Series

AIR POLLUTION CONTROL DISTRICT

Today's workshop seeks to:

1. Help our community better understand the health impacts associated with poor air quality and air pollution.

2. Discuss what efforts APCD, academia, health care professionals and others are implementing to improve air quality and decrease our exposure to unhealthy air.

3. Provide access to resources and information the community can use to protect their health and reduce exposure.

CLEARING THE AIR

2019 APCD Workshop Series

AIR POLLUTION CONTROL DISTRICT

Remember…

- There are **NO** silly questions
- Public Participation = PP
- Interactive/informal workshop
  - Ask questions as they come to mind
  - Feedback? Email *Clearingtheair@louisvilleky.gov*

Air Quality and Your Health

Air Pollution Control District
April 15, 2019

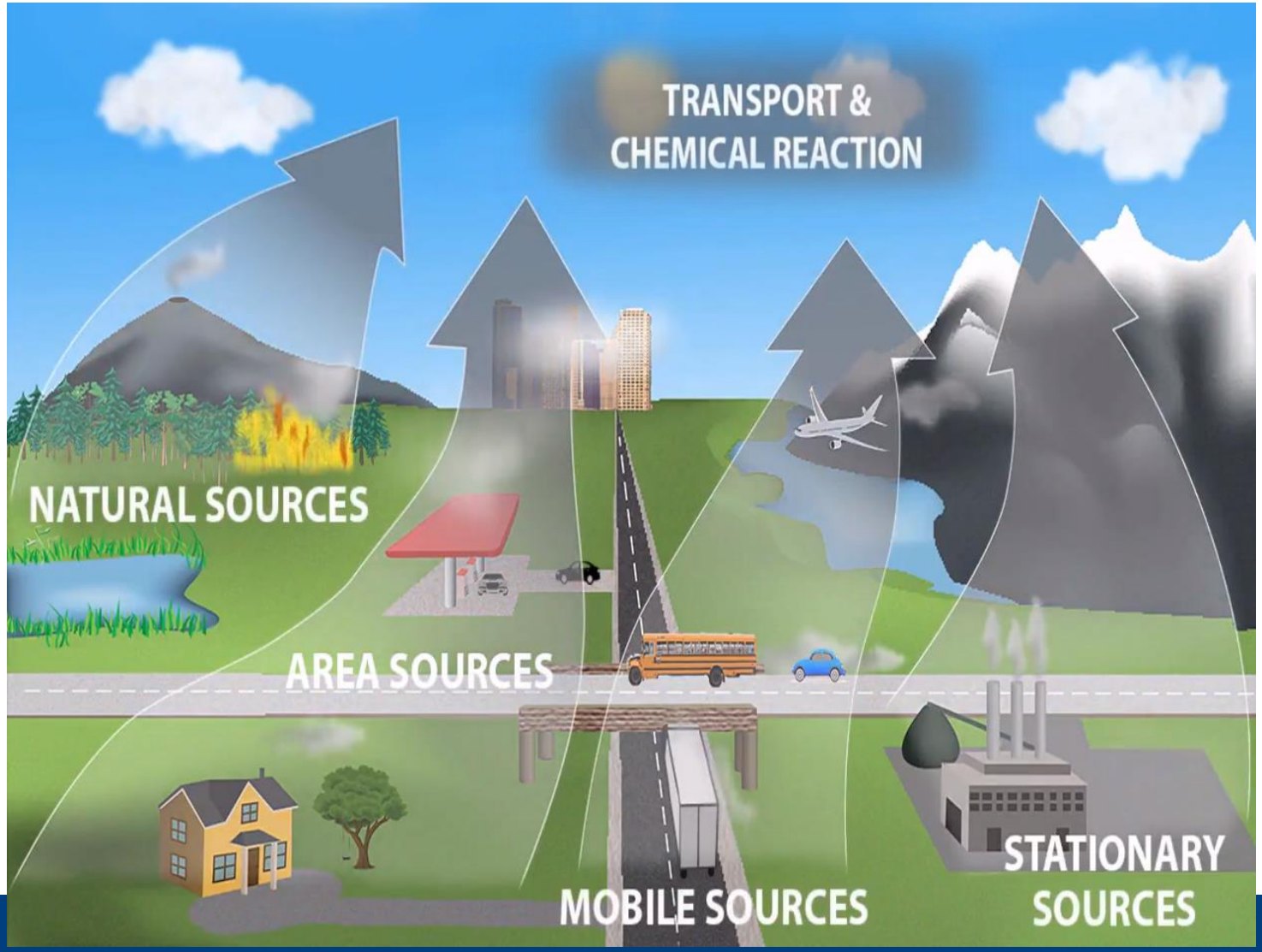
Health Impacts of Poor Air Quality*

- Obesity
- Learning disabilities
- Autism
- Diabetes
- Central nervous system
- Birth defects
- Lung diseases (cancer, asthma, COPD)
- Alzheimer's
- Allergies
- Headaches
- Respiratory System (irritation, inflammation, infections, Asthma)
- Cardiovascular diseases (heart attack, stroke)

**** Not an exhaustive list***

Outdoor Air

What contributes to poor air quality?

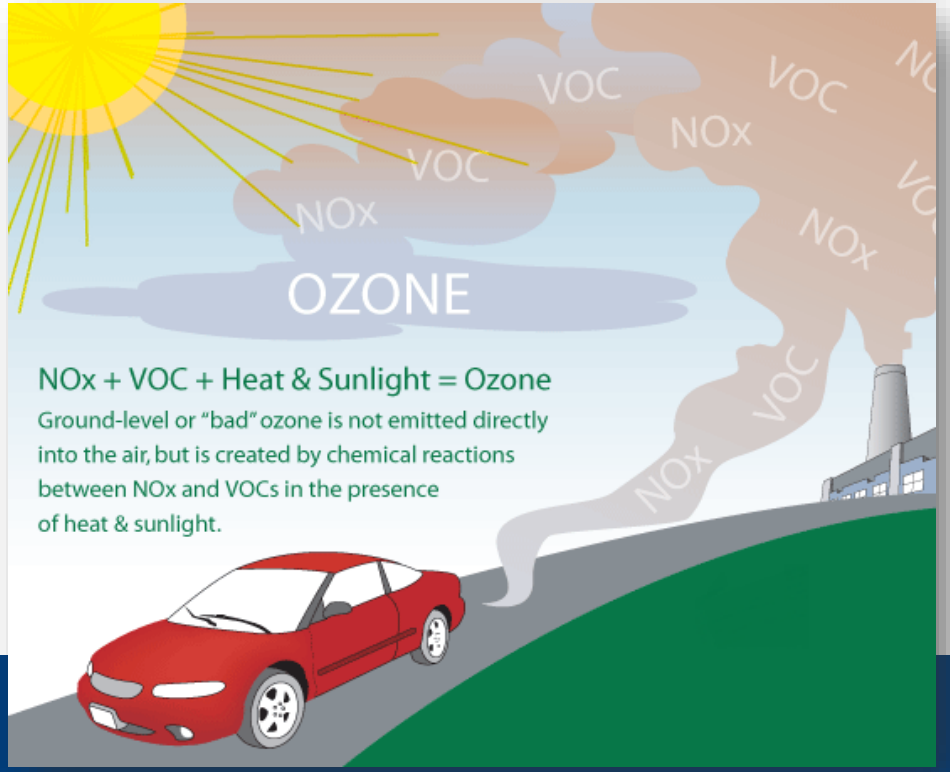


National Ambient Air Quality Standards (NAAQS)

- The Clean Air Act requires EPA to set NAAQS (40 CFR part 50)
- EPA sets NAAQS for **six principal pollutants,** which are called **"criteria" air pollutants:**
  - Carbon Monoxide
  - Lead
  - Particulate Matter
  - Oxides of Nitrogen
  - Sulfur Dioxide
  - Ozone

Ozone (O_3)

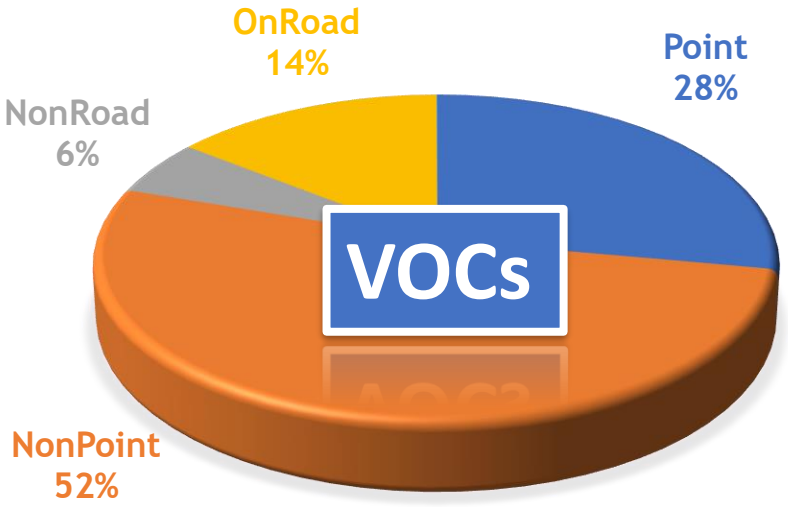
- Created via a chemical reaction:
  NOx + VOCs + Sunlight = O_3
- Louisville's Ozone season:
  March-October
- Health effects:
  - Shortness of breath
  - Inflame airways
  - Aggravate lung disease
  - Increase frequency of asthma attacks

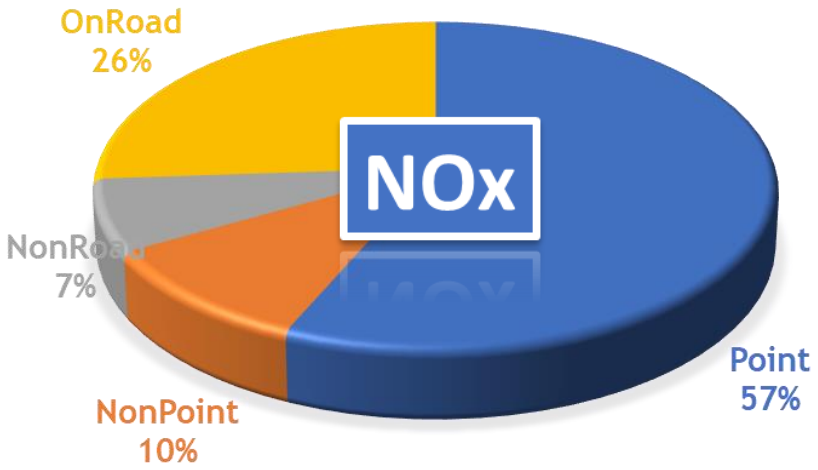


Volatile Organic Compounds (VOCs)

- What are they?
  - Organic compounds that easily become vapors or gases
  - Contributes to formation of ground-level ozone ("ozone precursor")
- Not a criteria pollutant
- Many VOCs are also air toxics
- Sources?
  - Gasoline engines and fueling
  - Solvents, paints, consumer products

What sources contribute to ozone in Louisville?

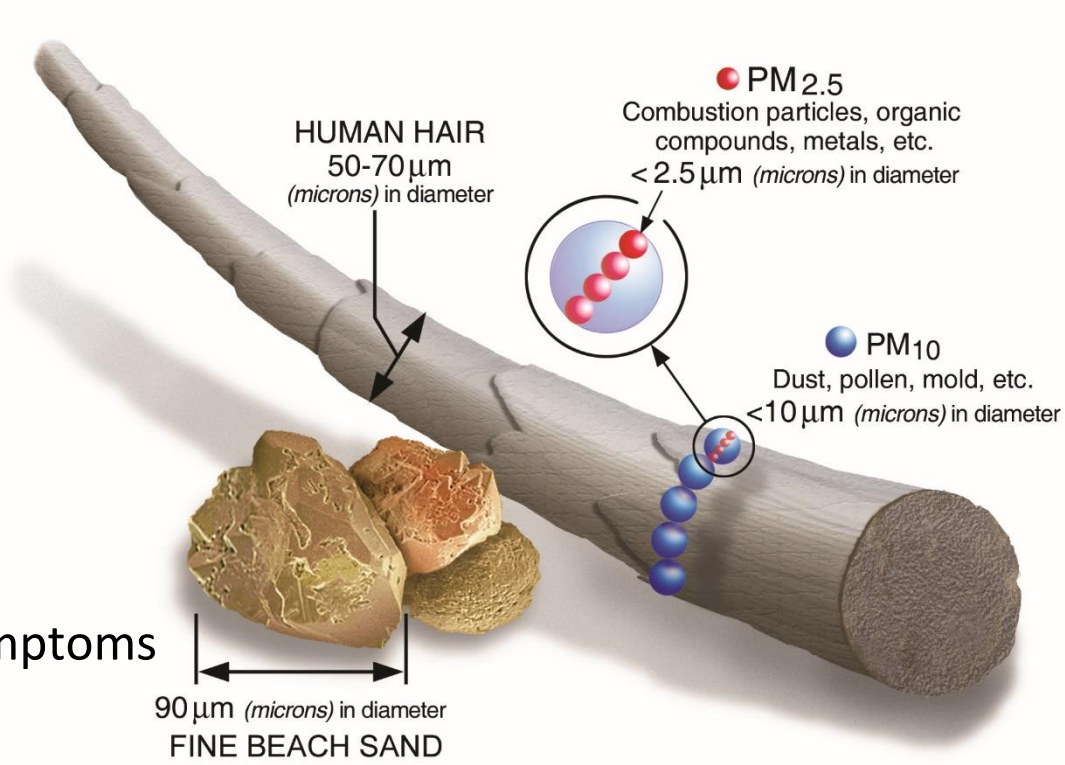




Data from 2014 National Emissions Inventory

Particulate Matter (PM)

- A complex mixture of particles and liquid droplets found in the air
- Categories:
  - Coarse Particles (PM_{10})
  - **Fine Particles ($PM_{2.5}$)**
- Health effects:
  - Aggravated asthma
  - Decreased lung function
  - Increased respiratory symptoms
  - Irregular heartbeat
  - Heart attacks



Particulate Matter (PM)

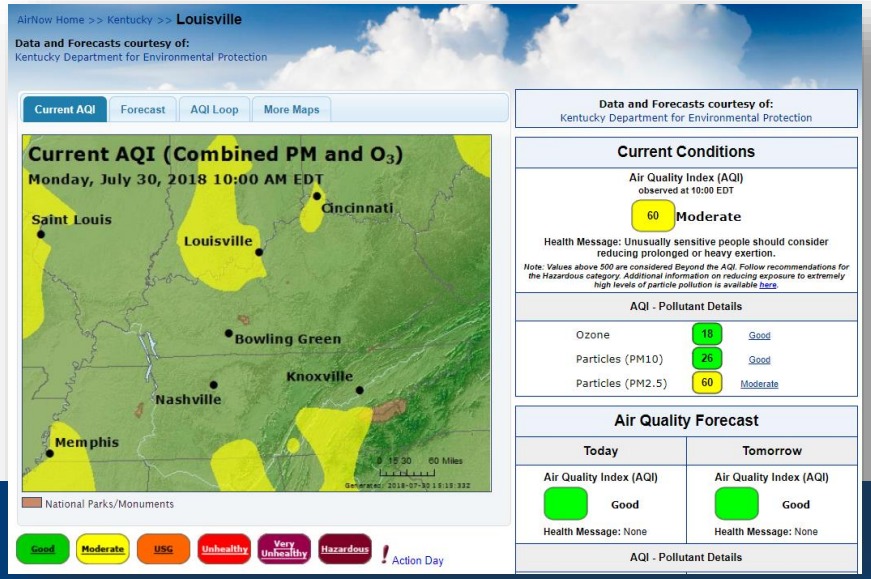
- Sources
  - Primary emissions = directly emitted from a source
    - Coal-fired power plants, construction sites, diesel engines
  - Secondary emissions = formed when gases, such as SO_2 and NOx react in the air

Current NAAQS Status

Pollutant	Standard	Averaging Time	Attainment Status
Carbon Monoxide	9 ppm	8-hour	Attainment
	35 ppm	1-hour	Attainment
Lead	0.15 µg/m^3	Rolling 3-month Average	Attainment
Nitrogen Dioxide	53 ppb	Annual Average	Attainment
	100 ppb	1-hour	Attainment
Particulate Matter (PM10)	150 µg/m^3	24-hour	Attainment
Particulate Matter (PM2.5)	12.0 µg/m^3	Annual Average	Attainment
	35 µg/m^3	24-hour	Attainment
Ozone	0.070 ppm	8-hour	Nonattainment
Sulfur Dioxide	75 ppb	1-hour	Partial County Nonattainment

Air Quality Index

- The AQI is generally based on monitored values for:
  - Ozone
  - Particle pollution/particulate matter
- AQI value of 100 generally corresponds to the NAAQS.
- **AQI values at or below 100 are generally thought of as satisfactory.**



AIR QUALITY INDEX

AirNow

A Guide to the AQI

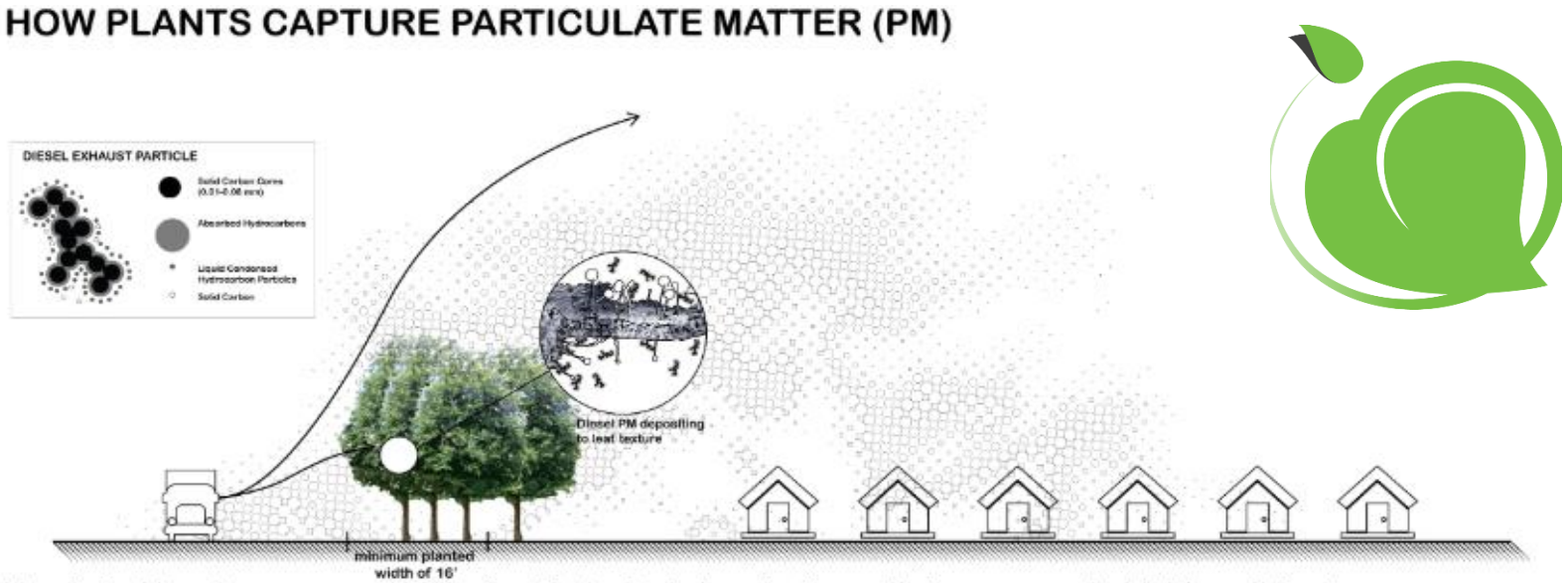
AQI Values	Actions to Protect Your Health From Ozone
Good (0 - 50)	None
Moderate (51 - 100*)	Unusually sensitive people should consider reducing prolonged or heavy outdoor exertion.
Unhealthy for Sensitive Groups (101 - 150)	The following groups should reduce prolonged or heavy outdoor exertion: - People with lung disease, such as asthma - Children and older adults - People who are active outdoors
Unhealthy (151 - 200)	The following groups should avoid prolonged or heavy outdoor exertion: - People with lung disease, such as asthma - Children and older adults - People who are active outdoors Everyone else should limit prolonged outdoor exertion.
Very Unhealthy (201 - 300)	The following groups should avoid all outdoor exertion: - People with lung disease, such as asthma - Children and older adults - People who are active outdoors Everyone else should limit outdoor exertion.

Idling Hotspots

As ambient air quality has improved over the years, we should not forget that near emission sources, exposure to air contaminants can be much higher.
For example, near idling vehicles.

Near-Road Environment

Areas near large roadways can experience higher exposure to air contaminants in vehicle exhaust too. Road design, vegetation, and other structures can have an impact on how those pollutants disperse.



Vegetated barriers are most effective if planted close to the pollution source in highly polluted areas.

Air Toxics Monitoring

- In addition to Criteria pollutant monitoring, APCD now monitors for Volatile Organic Compounds (VOCs)
- Objectives
  - Characterize ambient VOC concentrations in the vicinity of Rubbertown community
  - Evaluate photochemically reactive compounds in support of ozone reduction efforts (Photochemical Assessment Monitoring Station – PAMS)
  - Better understand the impacts on health

What compounds will be monitored?

APCD Target Compounds

Acrylonitrile
Benzene
Bromoform
1,3-Butadiene
Carbon tetrachloride
Chloroform
1,4-Dichlorobenzene
Dichloromethane
Tetrachloroethene
Trichloroethene
Vinyl chloride
Ethyl acrylate
Ethylbenzene
Methyl methacrylate
MIBK
Styrene
Toluene

Additional PAMS Compounds

Propylene
Isobutane
n-Butane
trans-2-Butene
1-Butene
cis-2-Butene
Cyclopentane
Isopentane
n-Pentane
trans-2-Pentene
1-Pentene
cis-2-pentene
Methylcyclopentane
2,3-Dimethylbutane
2-Methylpentane
3-Methylpentane
n-Hexane
Isoprene
2,2-Dimethylbutane
2,4-Dimethylpentane
Cyclohexane
2-Methylhexane
2,3-Dimethylpentane
3-Methylhexane
2,2,4-Trimethylpentane
n-Heptane
Methylcyclohexane
2,3,4-Trimethylpentane
2-Methylheptane
3-Methylheptane
n-Octane
m+p-Xylenes
o-Xylene
n-Nonane
Isopropylbenzene
a-Pinene
n-Propylbenzene
m+p-Ethyltoluene
1,3,5-Trimethylbenzene
o-Ethyltoluene
b-Pinene
1,2,4-Trimethylbenzene
n-Decane
1,2,3-Trimethylbenzene
m-Diethylbenzene
o-Diethylbenzene
n-Undecane
n- Dodecane

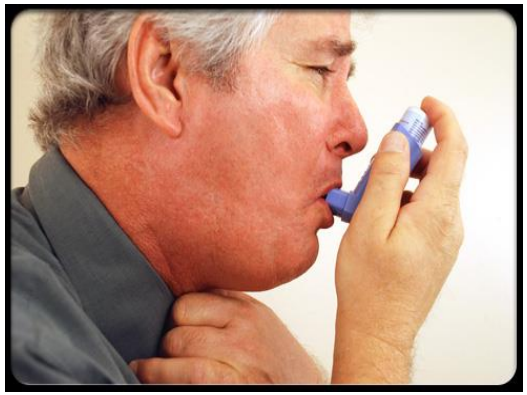
Total Air Toxics 2005 - 2017

Jefferson County, KY Sources	2005 Total Air Releases in Pounds	2017 Total Air Releases in Pounds	% Change
Electric Generating Utilities (EGUs)	4,703,167	851,342	-82% Decrease
Non-EGUs	3,443,604	1,309,085	-62% Decrease
Total	8,146,770	2,160,427	-73% Decrease

Source: EPA Toxics Release Inventory

Indoor Air

Asthma and Older Adults



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R01 Aims: For older adults with asthma we will:

1. Develop and systematically implement a phenotyping algorithm,
2. Longitudinally investigate the effects of (a) asthma phenotypes and (b) Volatile Organic Compounds (VOCs) exposures on asthma control.
3. Develop a predictive model of asthma quality of life.

This presentation:

- **Explored residential VOC exposure in older adults with asthma as related to asthma control and asthma quality of life.**

Volatile Organic Chemicals – 24 hour monitoring indoor and outdoor

- 187 people recruited
- +60 years old, nonsmoker
- Home assessments conducted between 4/2017 and 5/2019
- Conducted inside and outside air monitoring
- Integrated 24-hour samples
- Assessing potential asthma triggers

Sampling Protocol

Volatile Organic Compounds (85 VOCs)

PM 2.5 Particulates

Nitrogen Dioxide

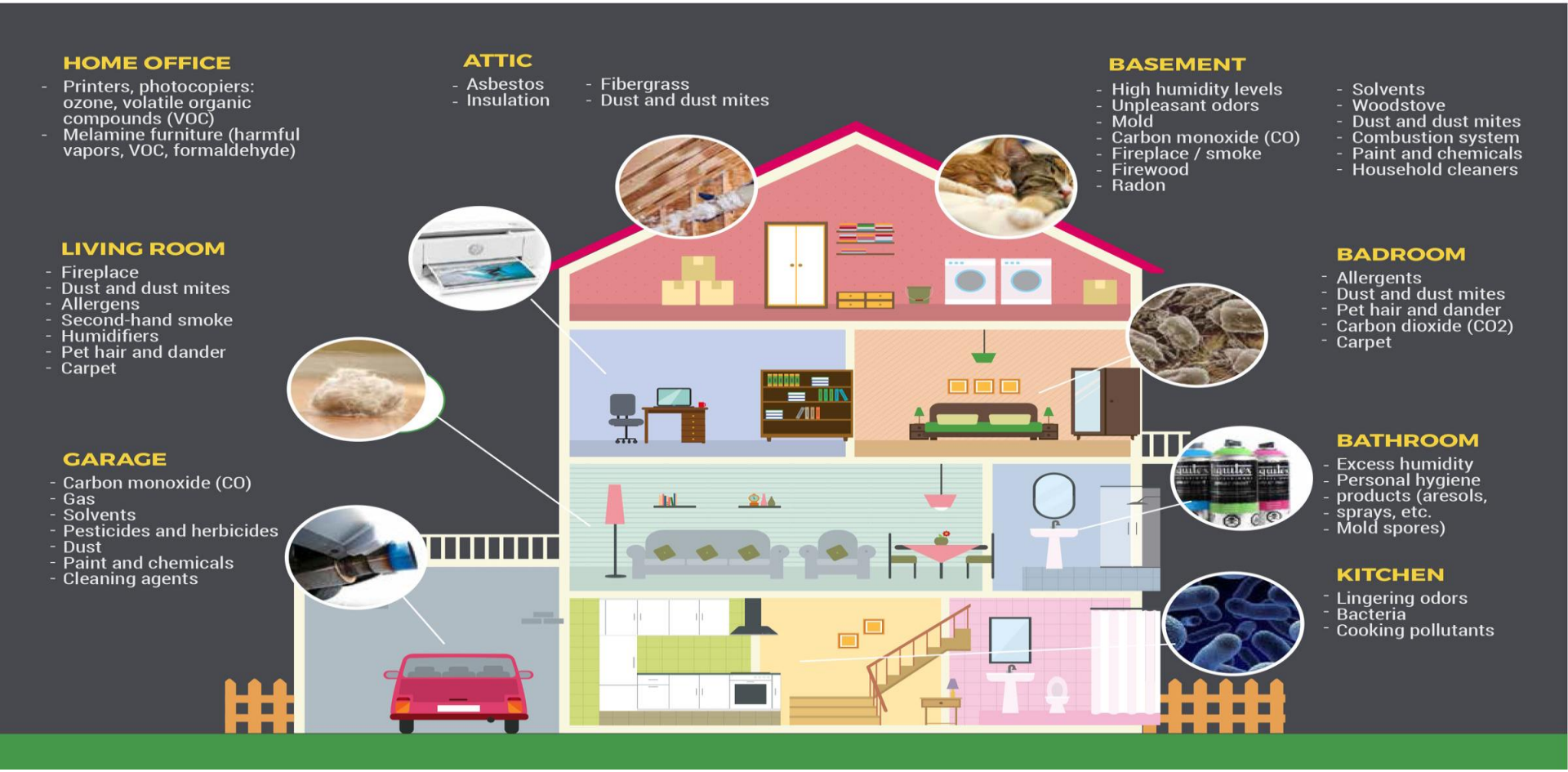
Carbon Dioxide

Carbon Monoxide

Temperature

Relative Humidity

PRIMARY SOURCES OF INDOOR AIR POLLUTION



Sources of Indoor Air Pollutants

Outdoor air

- Air pollutants
- Automobile exhaust
- Residual chemicals
- Pollen and molds

Activities

- Cooking
- Breathing
- Burning fossil fuels and wood (unvented)
- Smoking cigarettes
- Showering and boiling water

Building Materials and Furnishing

- Plywood and Particle board
- Carpets
- Flame retardants on cloth furniture, varnished wood
- Lead paint

Consumer Products

- Paints, paint strippers and other solvents
- Wood varnishes, preservatives
- Aerosol sprays
- Cleansers and disinfectants
- Stored fuels and automotive products
- Hobby supplies
- Dry-cleaned clothing
- Pesticides and moth balls
- Copiers and printers, correction fluids
- Glues and adhesives, permanent markers
- Candles
- Dryer sheets
- Air fresheners and fragrances

Other

- Mold when Humidity levels (>55%)
- Radon
- Biological, pet dander

Why are indoor air pollutants important?

- Increased Health risks
  1. 90+% of our time is indoors
  2. Exposure is often 24/7 for elderly and young children
  3. Pollutant concentrations are higher than ambient air
  4. Indoor air contains more chemicals, health assessments difficult due to complexity and potential synergisms
  5. Indoor air can be improved by decisions on products used in the home—if we know what chemicals are in our home

- Higher concentrations indoor
  1. Minimized hydroxyl radicals and sunlight to break down chemicals
  2. Limited space to diffuse concentrations
  3. Long life span of chemicals indoors
  4. Cumulative impacts of chemicals released indoors
  5. No wind or rain to diffuse or wash out pollutants

Location Of All Sites

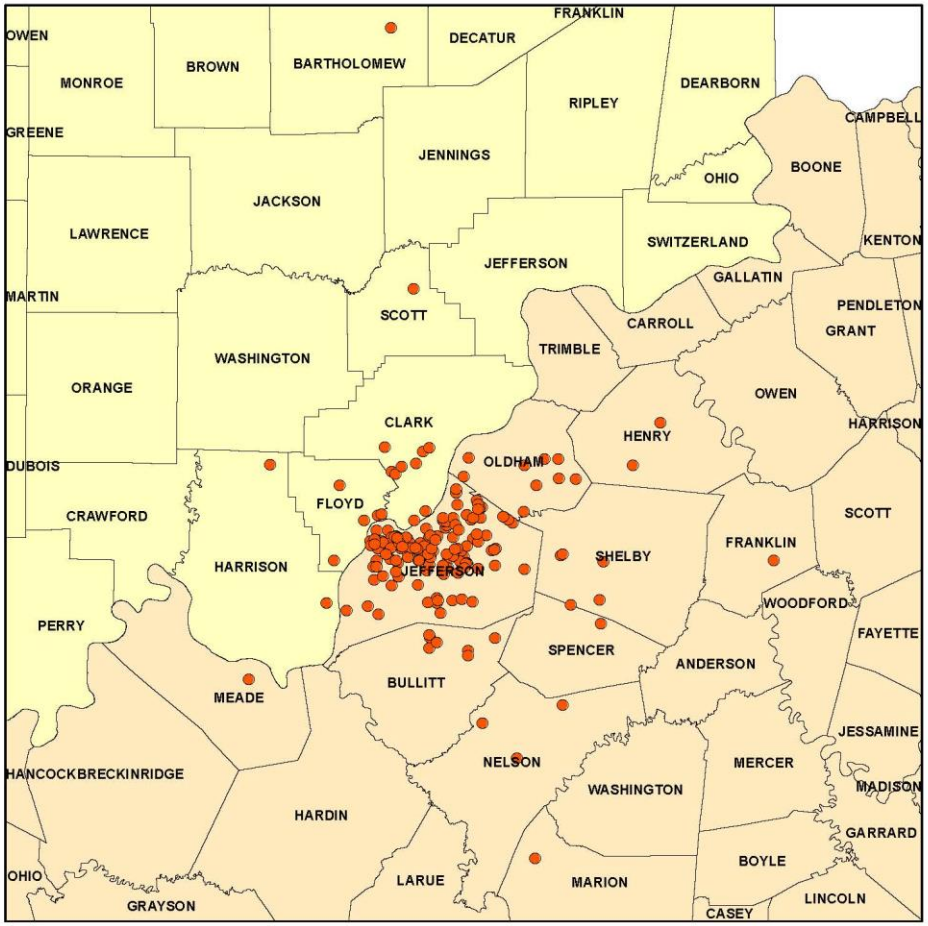
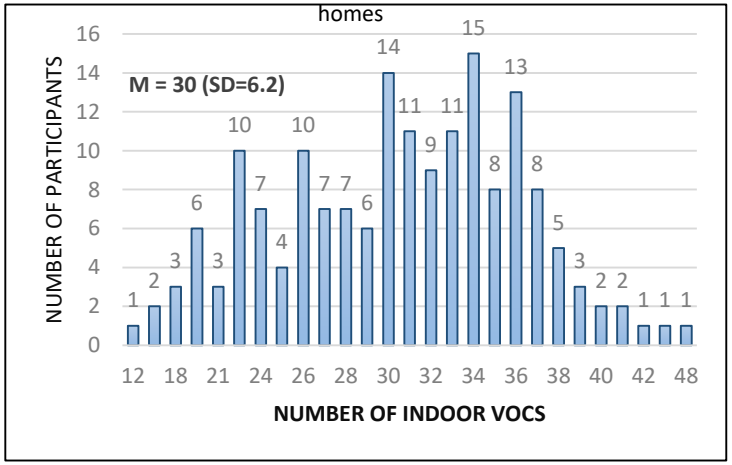


Figure 1.-- Location of all sites

- Study open to anyone who met the qualifications
- Some participants located up to 60 miles from Louisville in both KY and IN
- Provides information to understand the urban-rural continuum for air quality and asthma symptoms

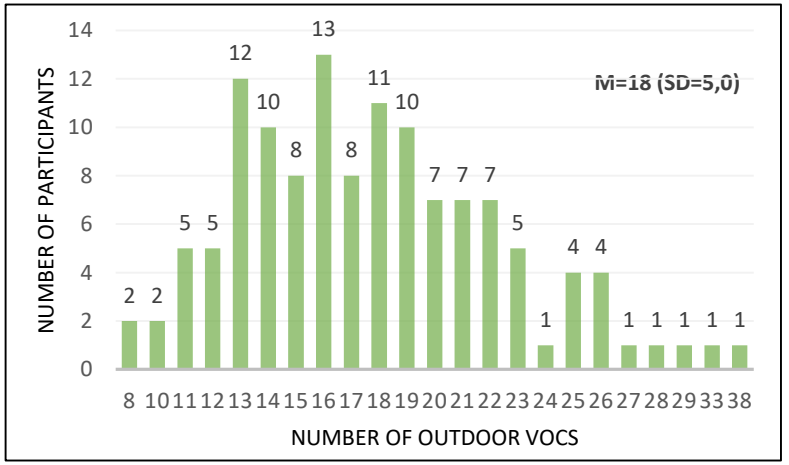
Number of VOCs detected in participant homes



12-48 different VOCs found in homes

72 different VOCs detected indoors

Number of VOCs detected outside of participant homes



8-38 different VOCs found outdoors

44 different VOCs detected outdoors

Concentrations indoors approximately 7.5 times outdoor concentrations

Total Outdoor VOC
N=183

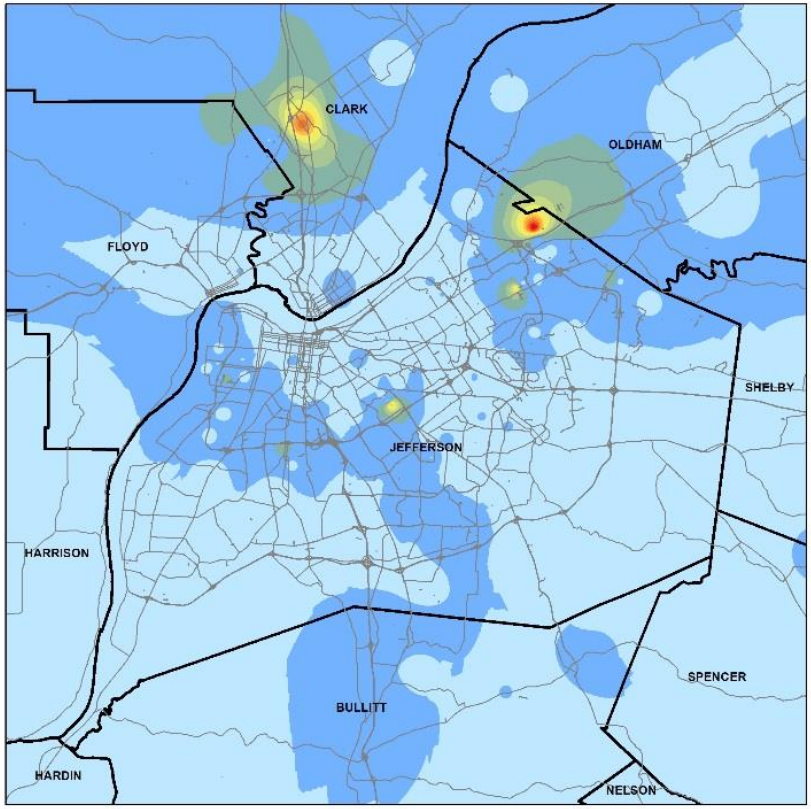


Figure 10. --Total Outdoor VOC ppbm

Legend
Outdoor VOC in ppbv

0.00053 - 9.1	56 - 64
9.2 - 18	65 - 73
19 - 27	74 - 82
28 - 36	83 - 91
37 - 45	92 - 100
46 - 55	110 - 110

Total Indoor VOC
N=183

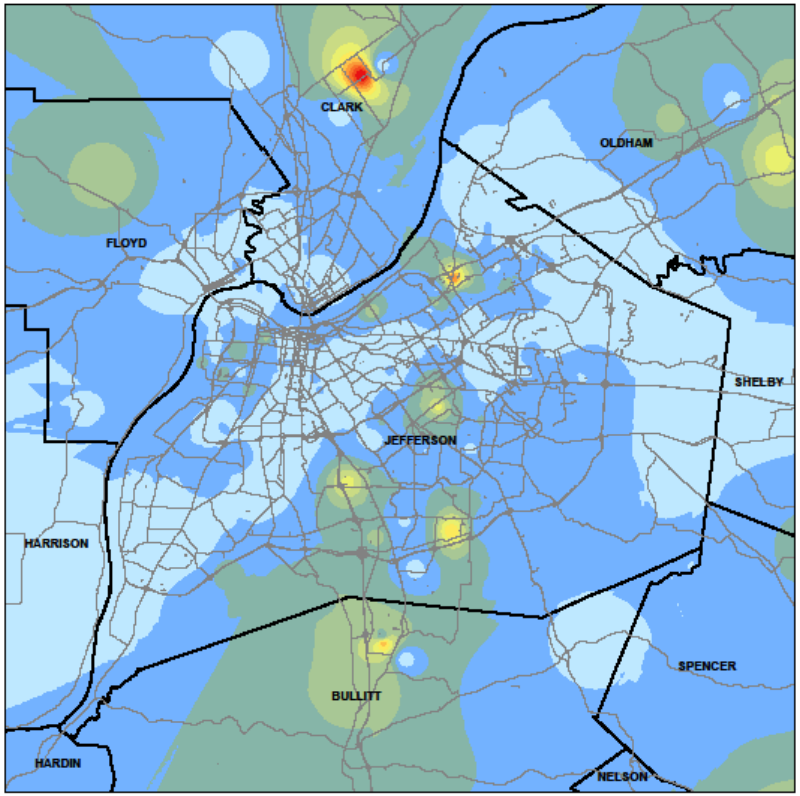


Figure 11. --Total Indoor VOC ppbm

Legend
Indoor VOC in ppbv

0.03809 - 50.6	303.5 - 354
50.61 - 101.2	354.1 - 404.5
101.3 - 151.7	404.6 - 455.1
151.8 - 202.3	455.2 - 505.6
202.4 - 252.8	505.7 - 556.2
252.9 - 303.4	556.3 - 606.8

Indoor Air Quality—chemicals detect 90%+ times 2017-2019

Those underlined– Average concentrations exceed health reference standards

Those in red bold – found in 99-100% of homes

Green—median below health reference standards

 RfC < 0.01 ppb

Blue – no reference standard concentration

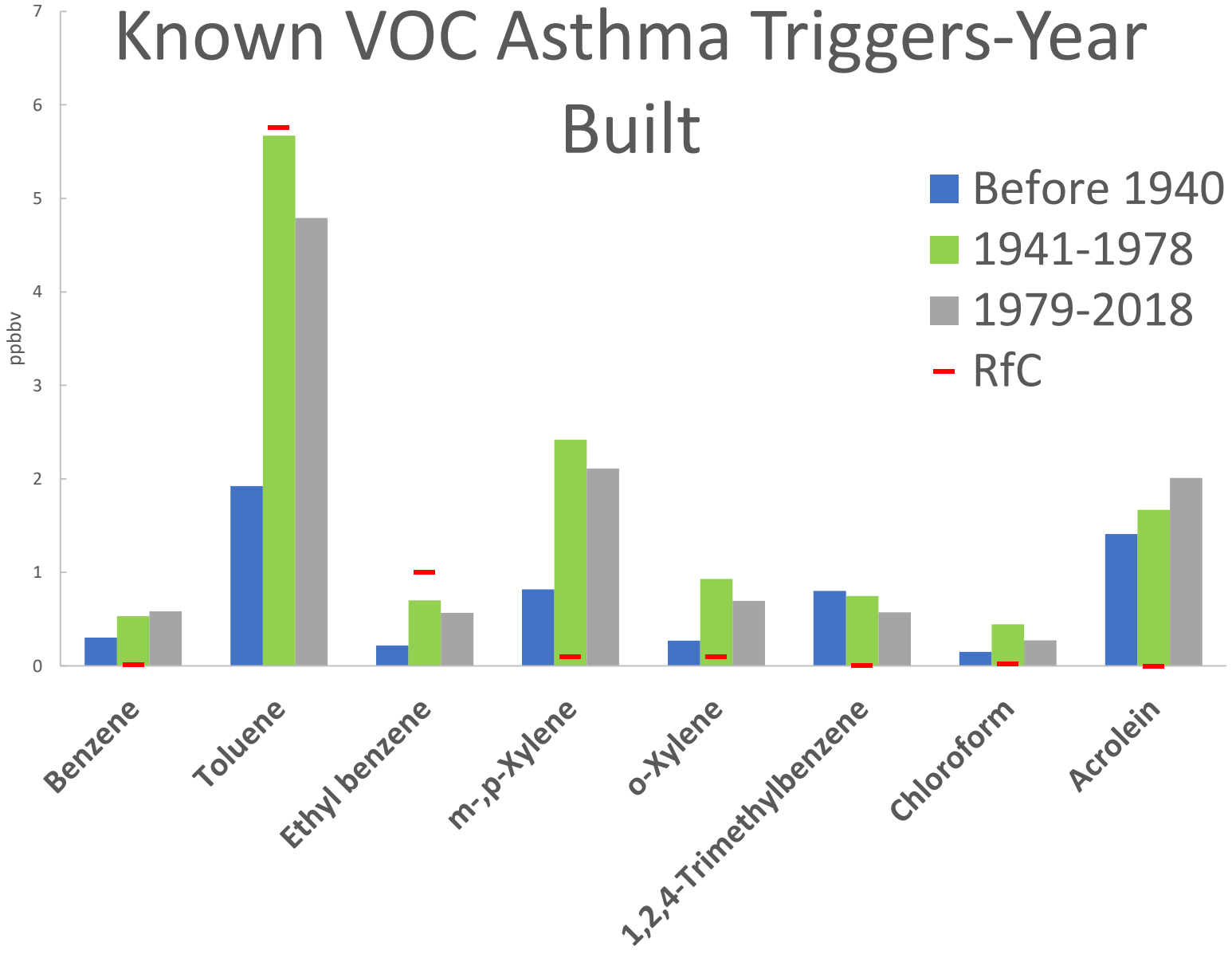
Freon 11	Acrolein 	Ethylbenzene	Freon 22
Freon 12	1,2,4 Trimethyl-benzene 	Methyl Ethyl Ketone	Toluene
Benzene 	Carbon Tetrachloride 	Methylene Chloride	Acetone
Chloromethane 	o Xylene	Hexane	Methyl Acetate
Chloroform 	m or p Xylene		

Residual VOCs Detected

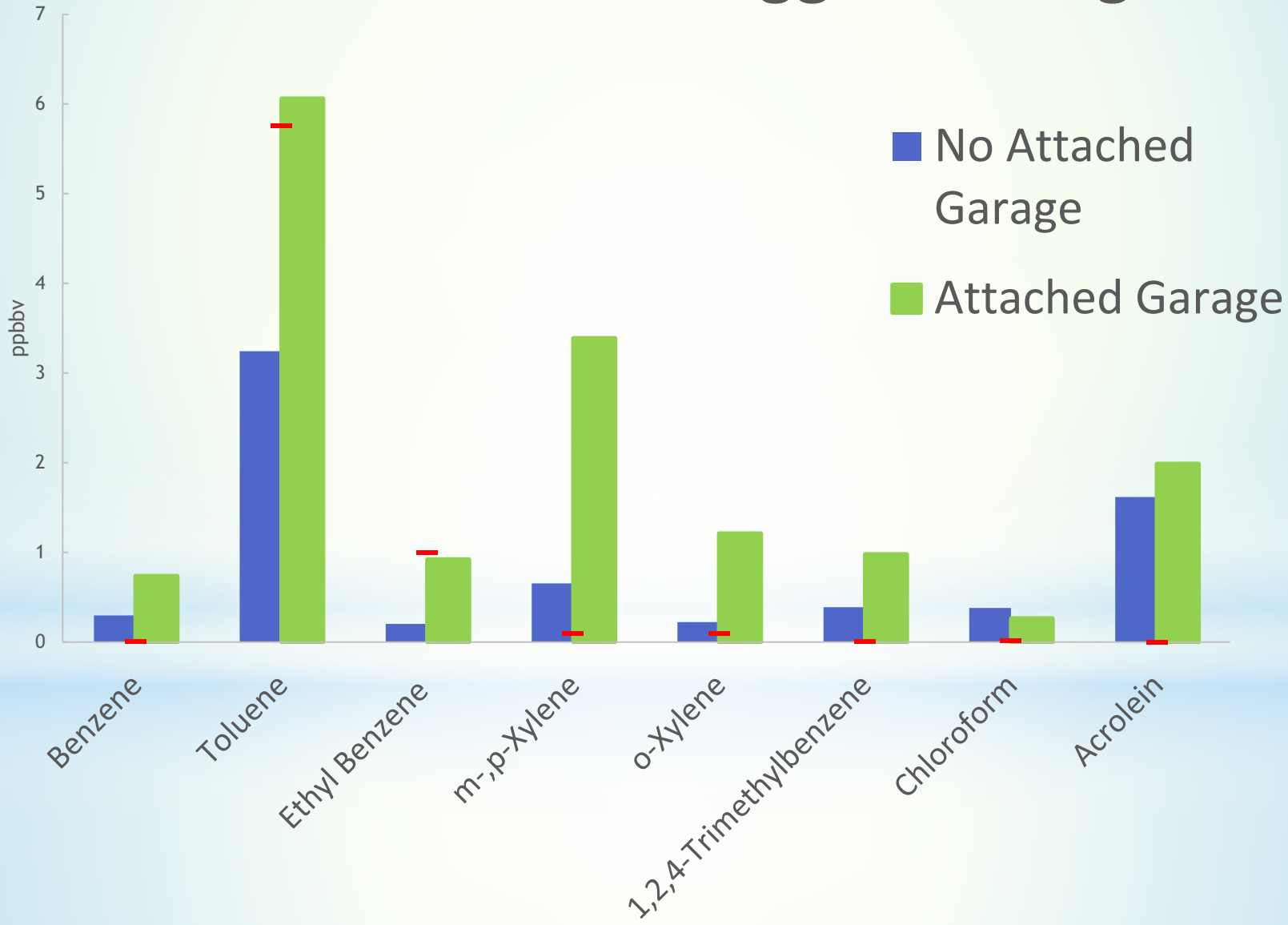
- Freon 11, 12, and 22 were banned 1/1/1996 under the 1987 Montreal Protocol
- Freon 113 and 114 banned in 2010
- All are greenhouse gas compounds
- Chloromethane was used as a refrigerant, no longer used in any consumer products
- Carbon tetrachloride phased out of use in 1990s due to its health (CNS, liver & kidney damage) concerns.

VOC	% Detect	Stan. Dev.	IndoorMean	RfC
Freon 11	100	1.43	0.31	0.11
Freon 12	100	0.35	0.57	0.01
Freon 22	100	51.53	0.68	61.39
Freon 113	90	0.03	0.09	17
Freon 114	3	0.02	0.05	NA
Chloromethane	100	1.05	0.77	0.09
Carbon Tetrachloride	95	0.05	0.09	0.02

Known VOC Asthma Triggers-Year Built



Known Asthma Triggers-Garage



So what VOCs are in your Home?

Acetone

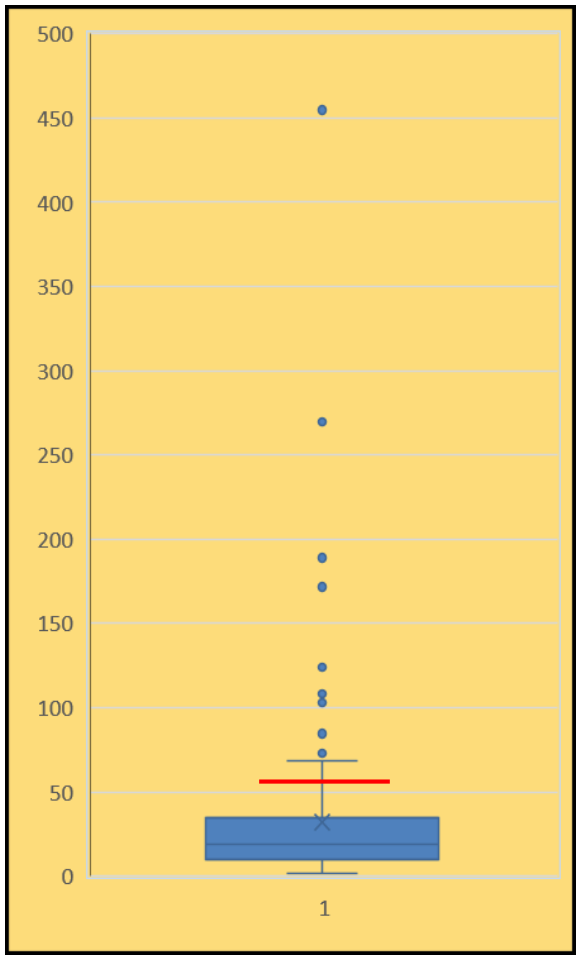
Sources:

Health Risks:

- Throat, eye, and respiratory irritation
- Nervous system (headaches, dizziness, confusion)
- Increased pulse rate
- Body quickly uses acetone to make sugar

- RfC = 56.68 ppb

Acetone



Statistic	Value (ppb)
Minimum	1.6
1st Quartile	9.83
Median—Indoor Outdoor	18.72 3.6
3rd Quartile	34.54
Maximum	458.74
RfC (red line)	56.68
Number	186
% homes, Indoor/Outdoor> 2	58%

Acetone
N=183

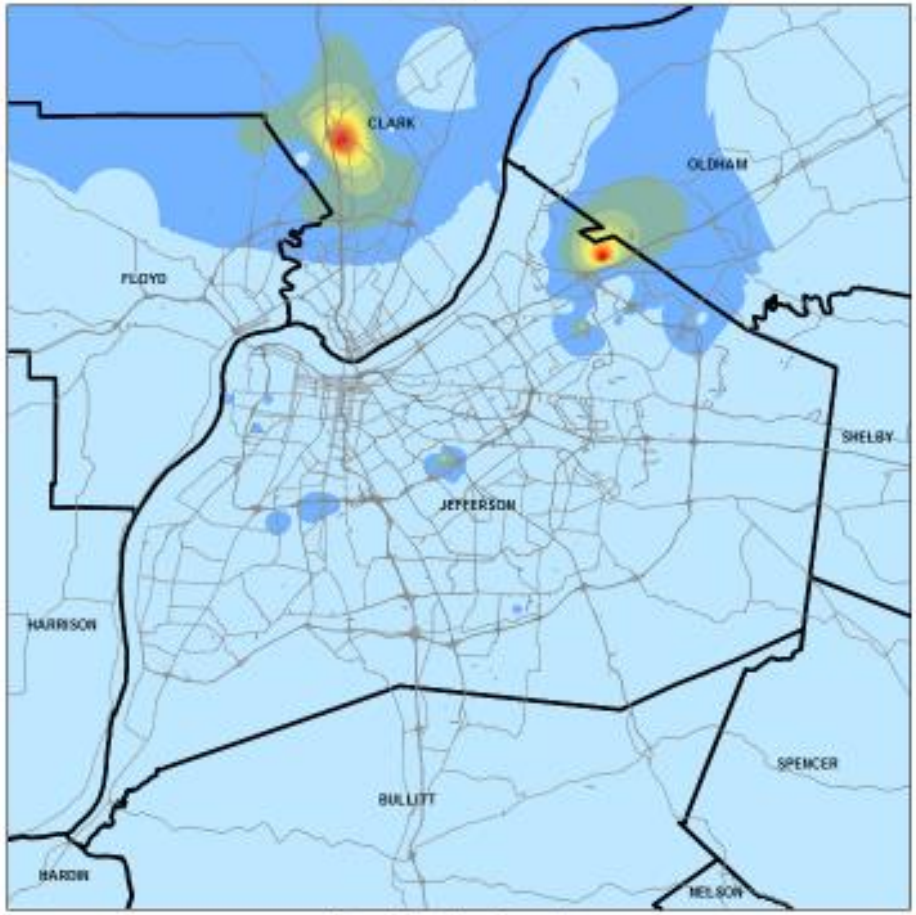


Figure 2. --Acetone ppbv

Legend
Outdoor VOC in ppbv

0.00028 - 6.9	42 - 48
7 - 14	49 - 55
15 - 21	56 - 62
22 - 28	63 - 69
29 - 35	70 - 76
36 - 41	77 - 83

Acrolein

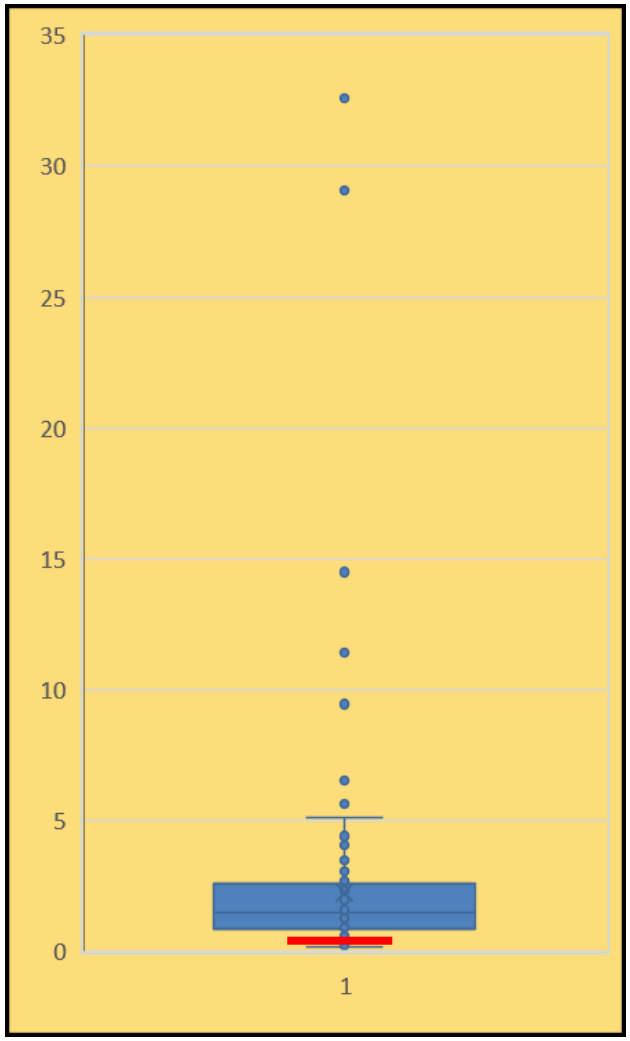
Sources:

Health Risks:

- Cardiovascular disease
- Respiratory disease
- Eye, nose, lung irritant

- RfC = 0.00004 ppb

Acrolein



Statistic:	Value: (ppb)
Minimum	0.17
1st Quartile	0.83
Median—Indoor Outdoor	1.5 0.46
3rd Quartile	2.56
Maximum	32.59
RfC (red line)	0.00004
Number	180

# Acrolein
N=183

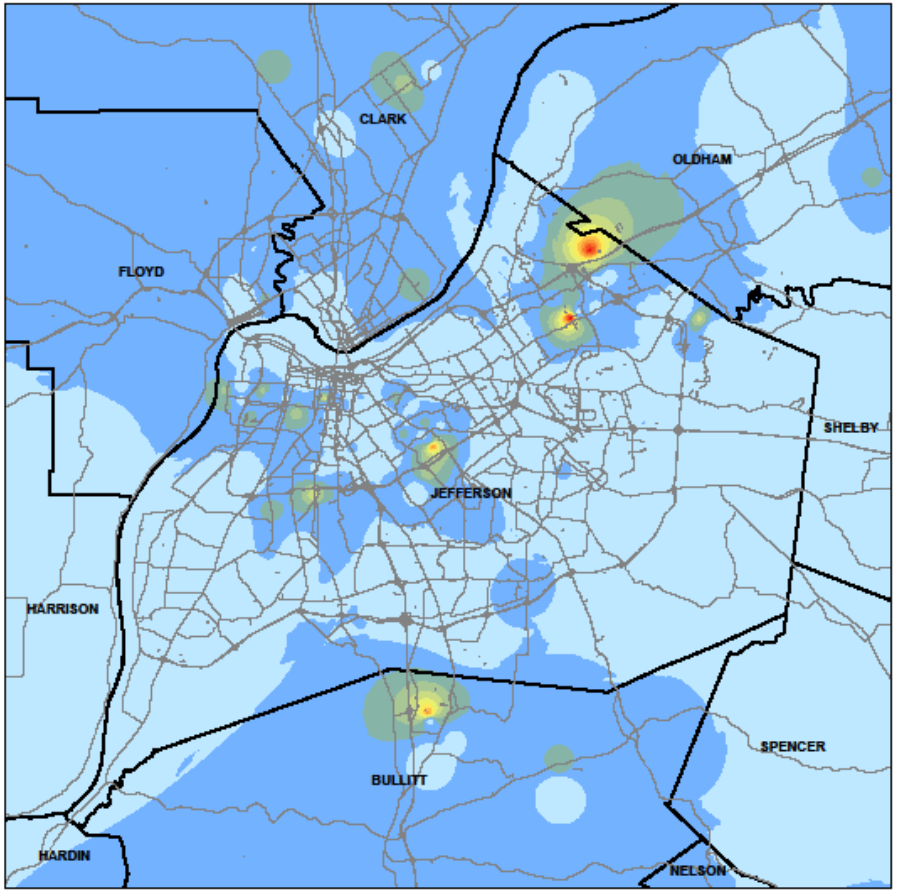


Figure 3. --Acrolein ppbv

Legend
Outdoor VOC in ppbv

0.000000473 - 0.371	2.24 - 2.6
0.372 - 0.743	2.61 - 2.97
0.744 - 1.11	2.98 - 3.34
1.12 - 1.49	3.35 - 3.71
1.5 - 1.86	3.72 - 4.09
1.87 - 2.23	4.1 - 4.46

Benzene

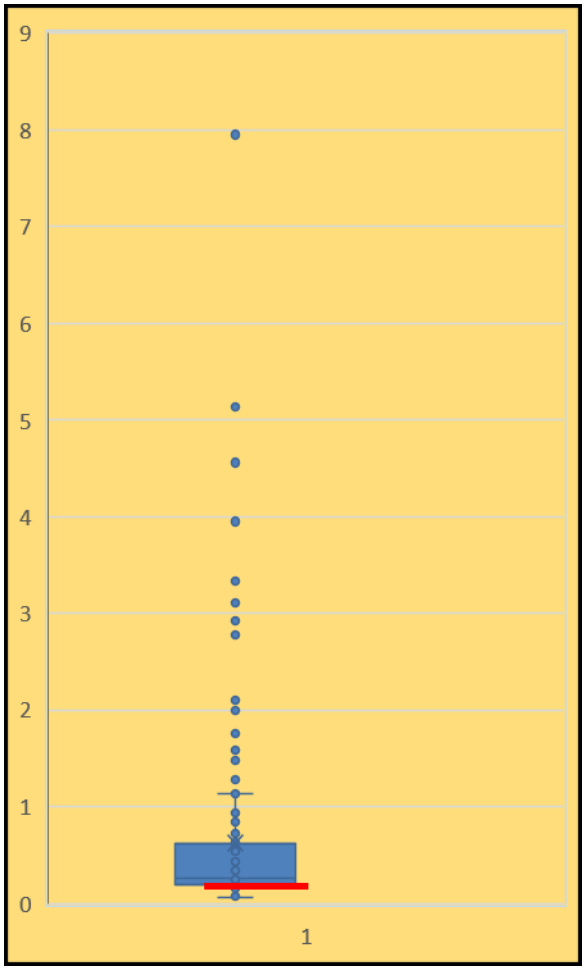
Sources:

Health Risk:

- Known human carcinogen (leukemia)
- Skin, eye, throat irritant
- Central nervous system (drowsiness, confusion)
- Low red blood count (weakness)
- Low white blood count (immunity)

- Rfc = 0.01 ppb

Benzene



Statistic	Value (ppb)
Minimum	0.06
1st Quartile	0.19
Median—Indoor Outdoor	0.26 0.14
3rd Quartile	0.62
Maximum	7.95
RfC (red line)	0.01
Number	185

# Benzene
N=183

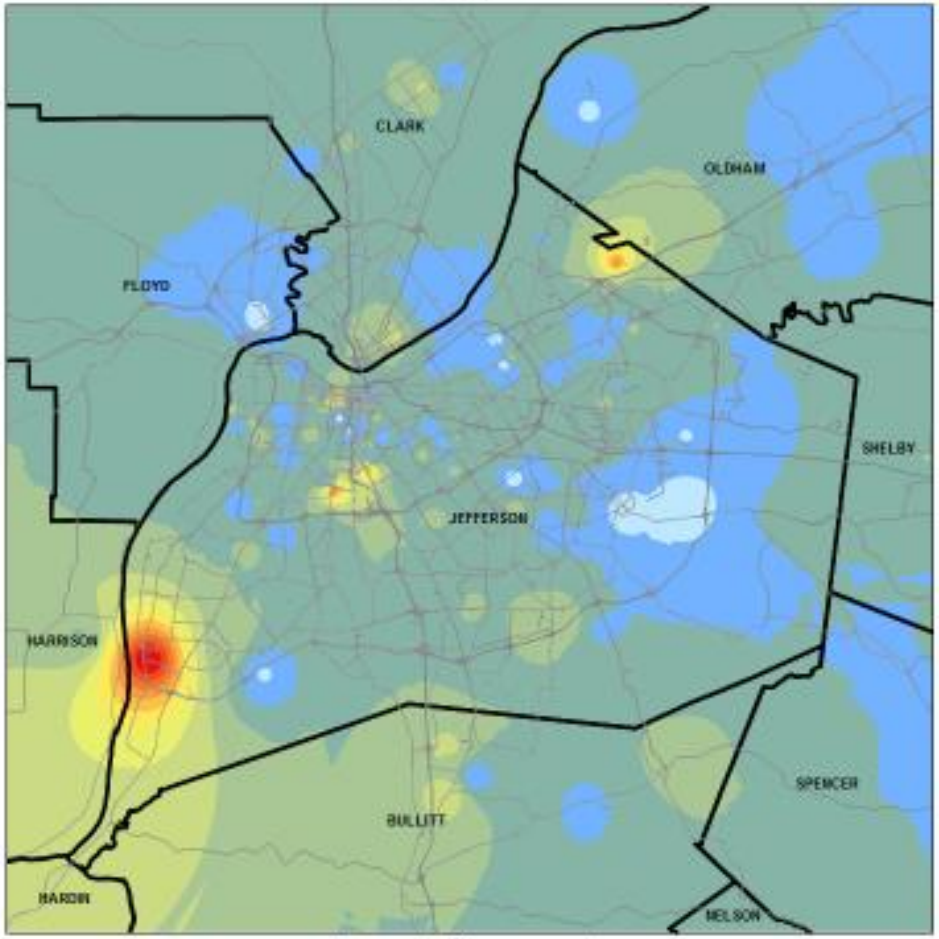


Figure 4. --Benzene ppbv

Legend
Outdoor VOC in ppbv

0.0000108 - 0.0575	0.346 - 0.402
0.0576 - 0.115	0.403 - 0.46
0.116 - 0.172	0.461 - 0.517
0.173 - 0.23	0.518 - 0.575
0.231 - 0.287	0.576 - 0.632
0.288 - 0.345	0.633 - 0.69

Carbon Tetrachloride

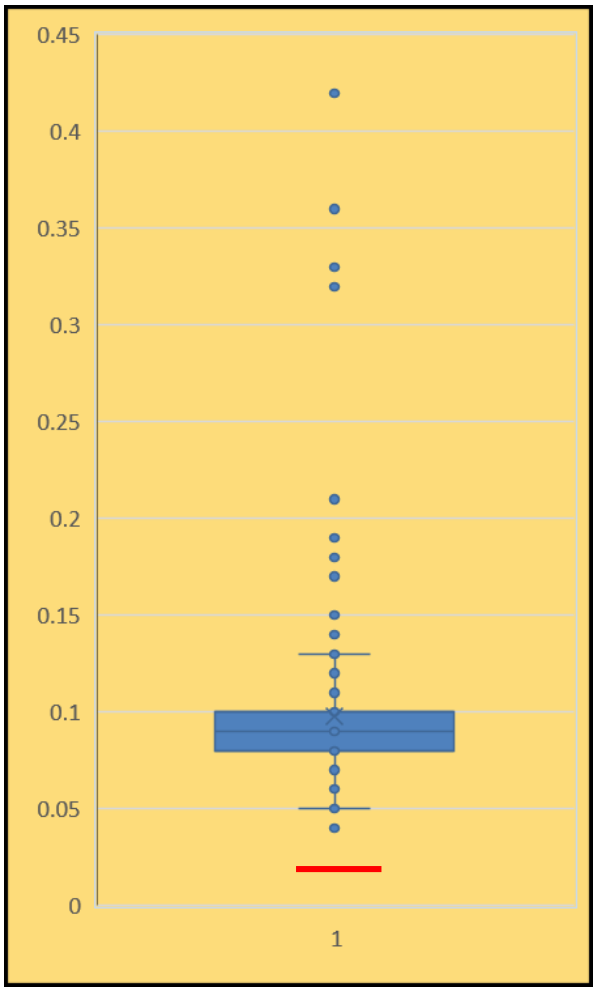
Sources:

Health Risks:

- Highly toxic to liver and kidneys
- Probable human carcinogens
- Banned from consumer products

- RfC = 0.02 ppb

Carbon Tetrachloride



Statistic	Value (ppb)
Minimum	.04
1st Quartile	0.08
Median—Indoor Outdoor	0.09 0.08
2nd Quartile	0.1
Maximum	0.42
RfC (red line)	0.02
Number	175

Chloroform

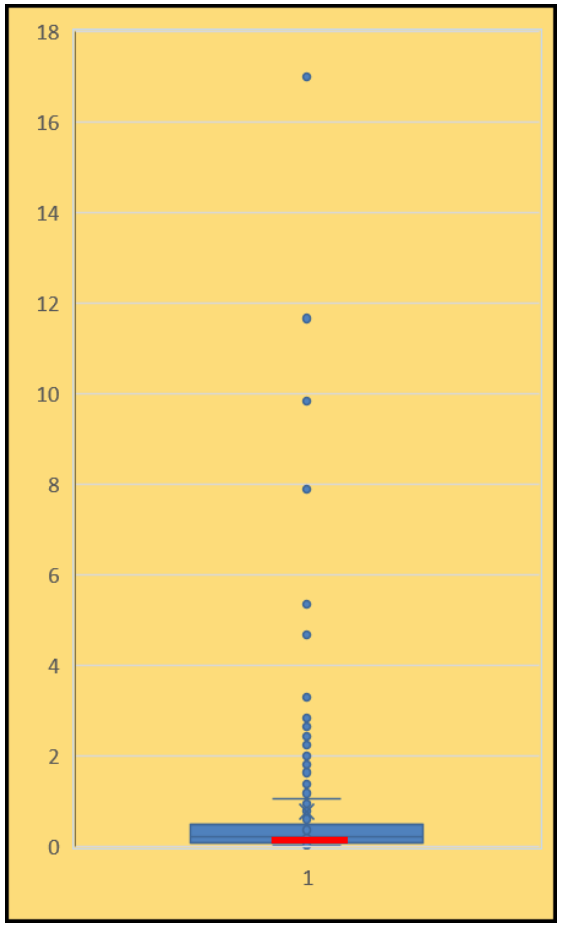
Sources:

Health Risks:

- Probable human carcinogen
- Nervous system depression
- Heartbeat irregularities
- Hepatitis
- Jaundice
- Kidney/liver damage
- asthma

- Rfc = 0.02 ppb

Chloroform



Statistic	Value (ppb)
Minimum	0.03
1at Quartile	0.09
Median	0.19
3rd Quartile	0.39
Maximum	9.29
RfC (red line)	.02
Number	180

Chloroform
N=183

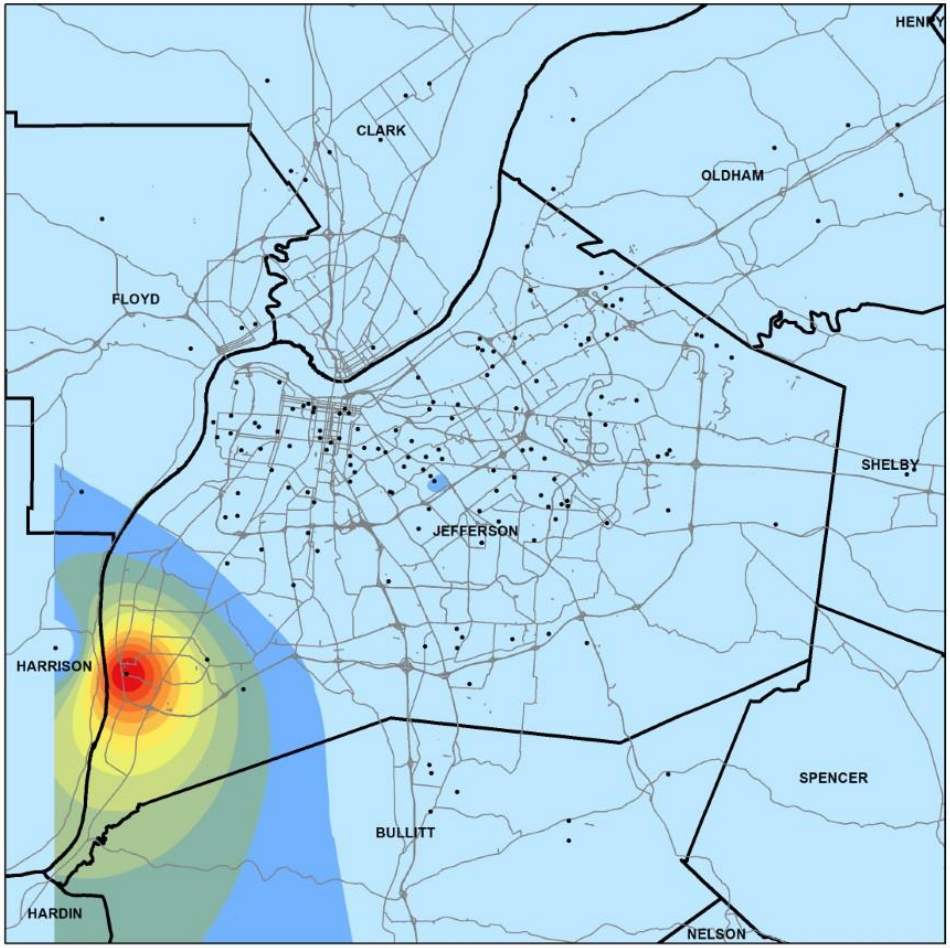


Figure 6. --Chloroform

Legend
Outdoor VOC in ppbv

0.02 - 0.16	0.88 - 1
0.17 - 0.3	1.1 - 1.2
0.31 - 0.45	1.3 - 1.3
0.46 - 0.59	1.4 - 1.4
0.6 - 0.73	1.5 - 1.6
0.74 - 0.87	1.7 - 1.7

Methylene Chloride

Sources:

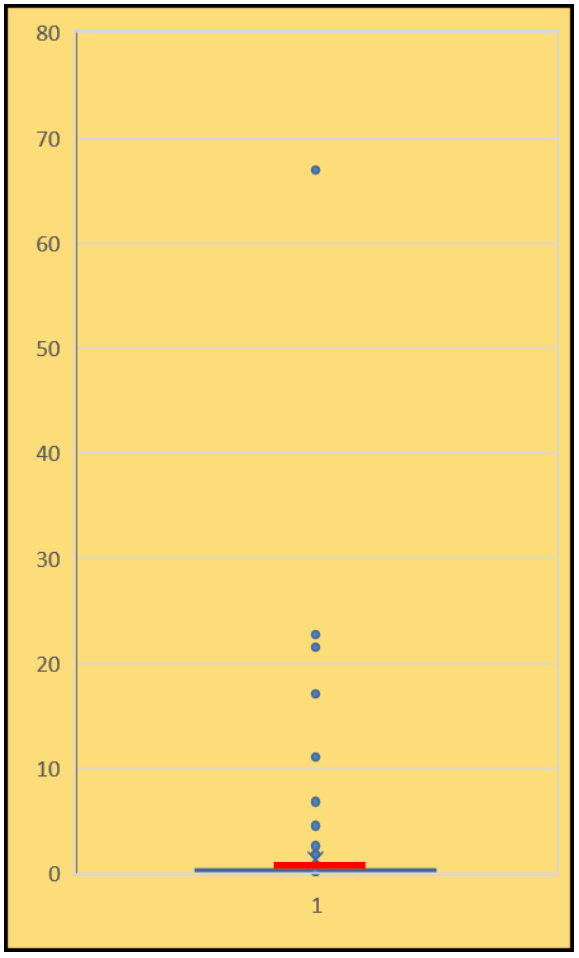
Nov 24, 2019 banned

Health Risks:

- Central nervous system (visual, auditory, psychomotor functions)
- Liver, kidney, cardiovascular function impairment
- Probable human carcinogen
- Asthma

- RfC = 0.75 ppb

Methylene Chloride



Statistic:	Value (ppb)
Minimum	0.09
1st Quartile	0.16
Median—Indoor Outdoor	0.21 0.14
3rd Quartile	0.4
Maximum	66.98
RfC (red line)	0.75
Number	176

Methylene Chloride
N=183

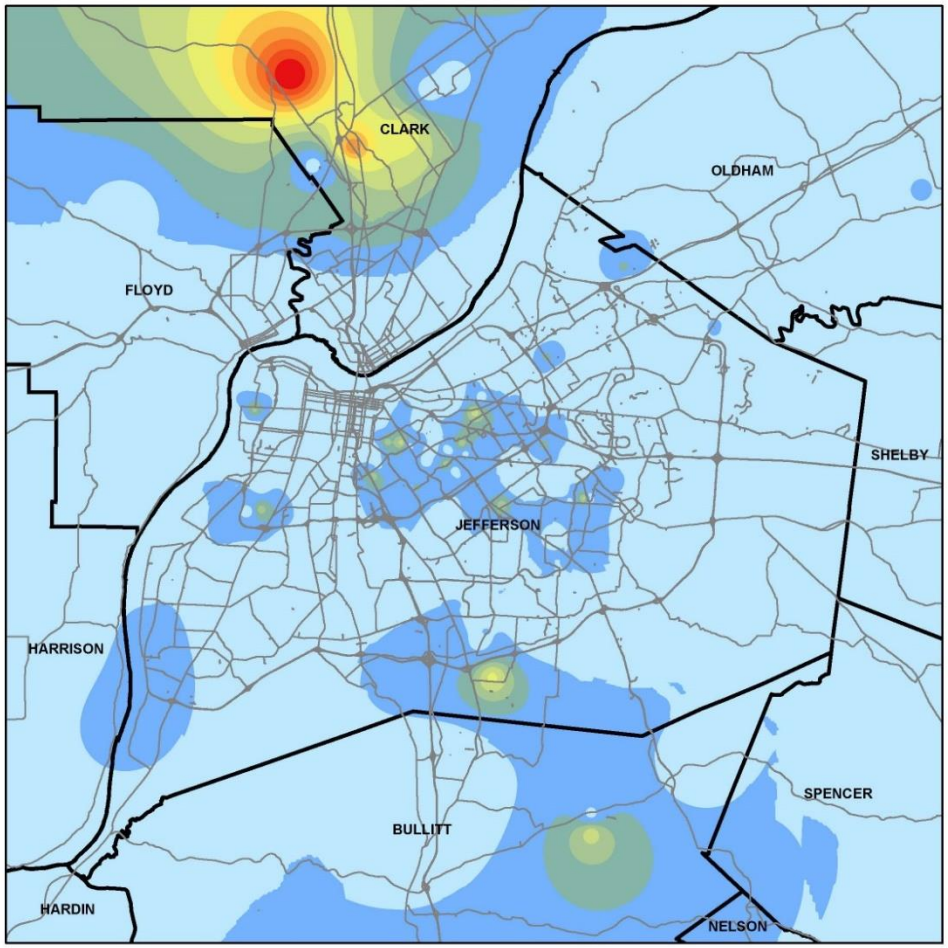


Figure 7. --Methylene Chloride ppbv

Legend
Outdoor VOC in ppbv

0.00000011 - 0.21	1.3 - 1.5
0.22 - 0.42	1.6 - 1.7
0.43 - 0.62	1.8 - 1.9
0.63 - 0.83	2 - 2.1
0.84 - 1	2.2 - 2.3
1.1 - 1.2	2.4 - 2.5

Toluene

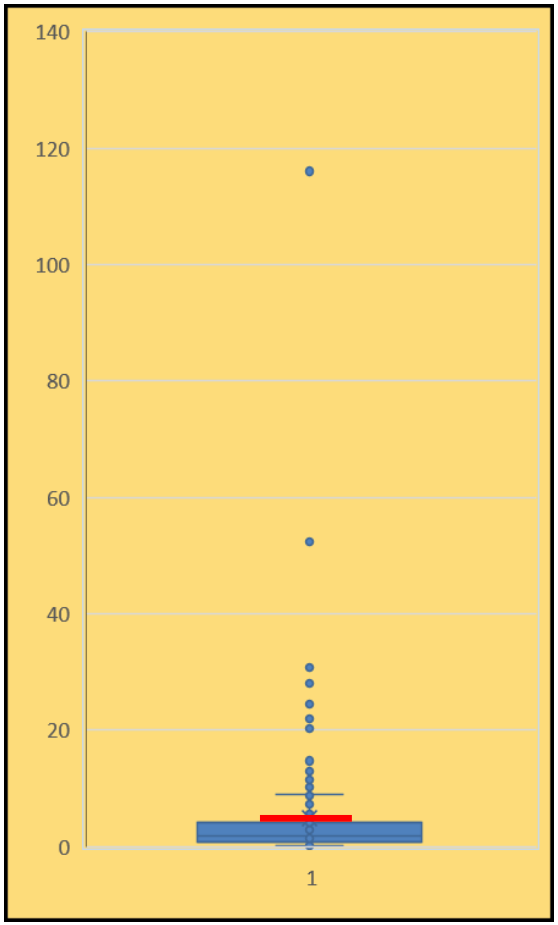
Sources:

Health Risks:

- CNS (dizziness, fatigue, headaches, nausea)
- Depressed immune system
- Kidney and liver damage
- Reproductive impacts

- RfC = 5.76 ppb

Toluene



Statistic:	Value (ppb)
Minimum	0.07
1st Quartile	0.73
Median—Indoor Outdoor	1.83 0.18
3rd Quartile	4.23
Maximum	116.26
RfC (red line)	5.76
Number	186

Toluene
N=183

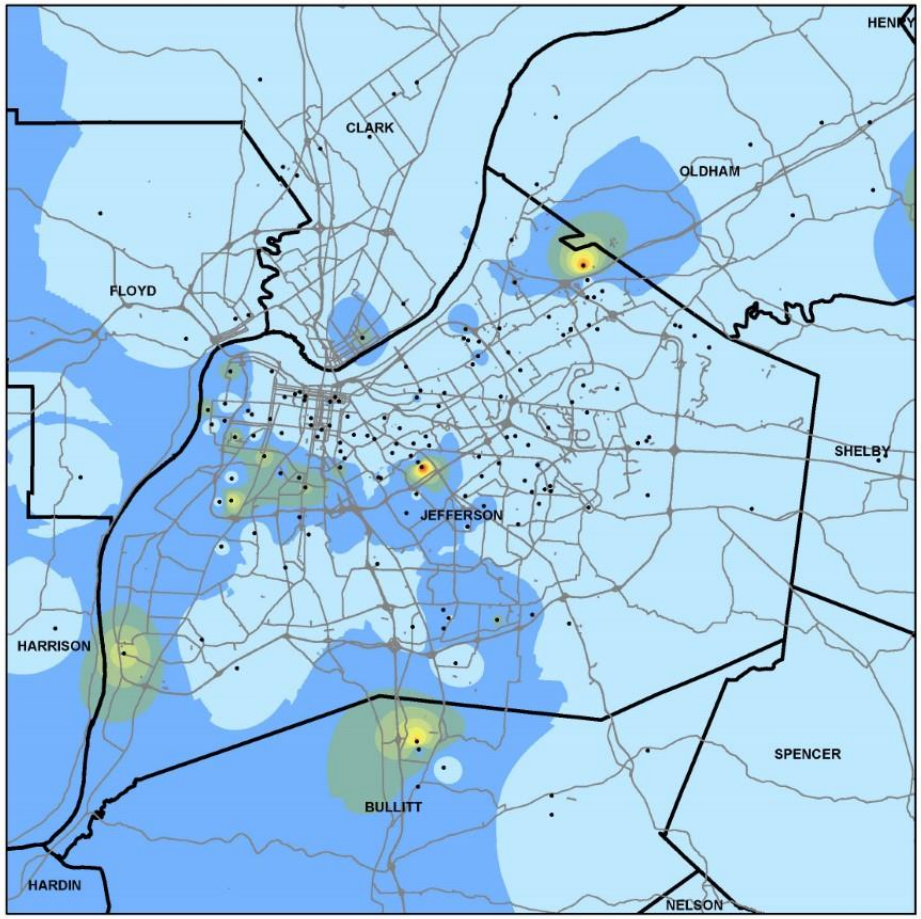


Figure 8. --Toluene

Legend
Outdoor VOC in ppbv

0.02 - 0.16	0.88 - 1
0.17 - 0.3	1.1 - 1.2
0.31 - 0.45	1.3 - 1.3
0.46 - 0.59	1.4 - 1.4
0.6 - 0.73	1.5 - 1.6
0.74 - 0.87	1.7 - 1.7

Xylene (m,p,o)

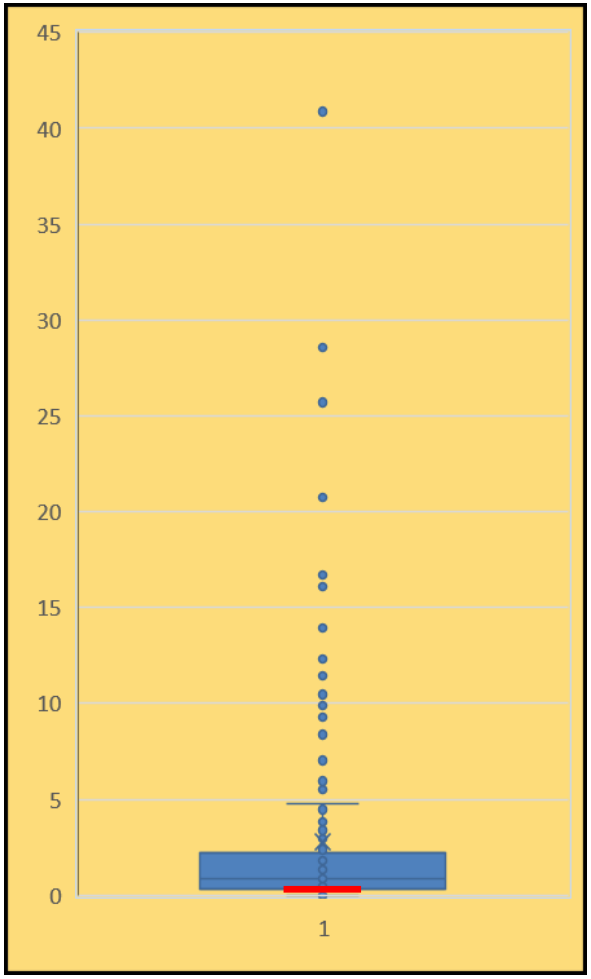
Sources:

Health Risks:

- Eye, nose, throat, gastrointestinal irritant
- CNS (headaches, dizziness, fatigue, incoordination)
- Respiratory, cardiovascular and kidney function impairment

- RfC = m,p 0.1 ppb; o 0.8 ppm

Xylene



Statistic:	Value (ppb)
Minimum	0.04
1st Quartile	0.33
Median—Indoor Outdoor	0.83 0.05
3rd Quartile	2.19
Maximum	41
RfC (red line)	0.1
Number	183

Xylene

N=183

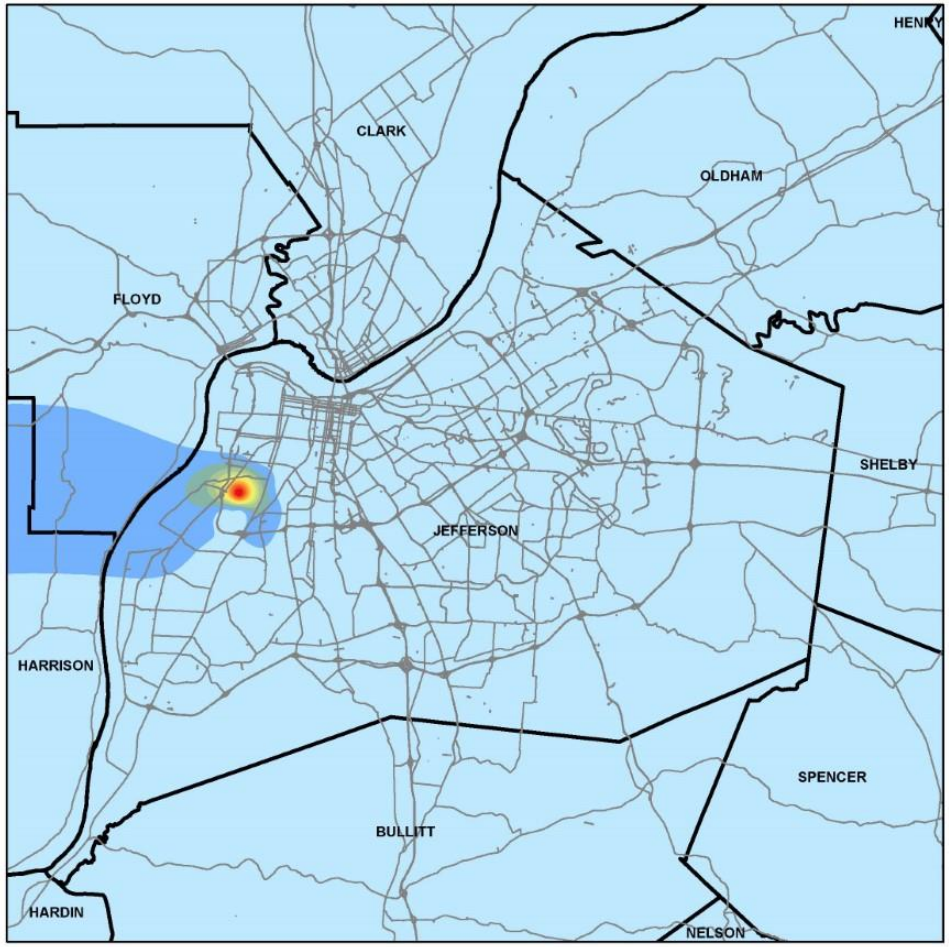


Figure 9. --Zylene

Legend

Outdoor VOC in ppbv

0.02 - 0.16	0.88 - 1
0.17 - 0.3	1.1 - 1.2
0.31 - 0.45	1.3 - 1.3
0.46 - 0.59	1.4 - 1.4
0.6 - 0.73	1.5 - 1.6
0.74 - 0.87	1.7 - 1.7

1,2,4 Trimethylbenzene

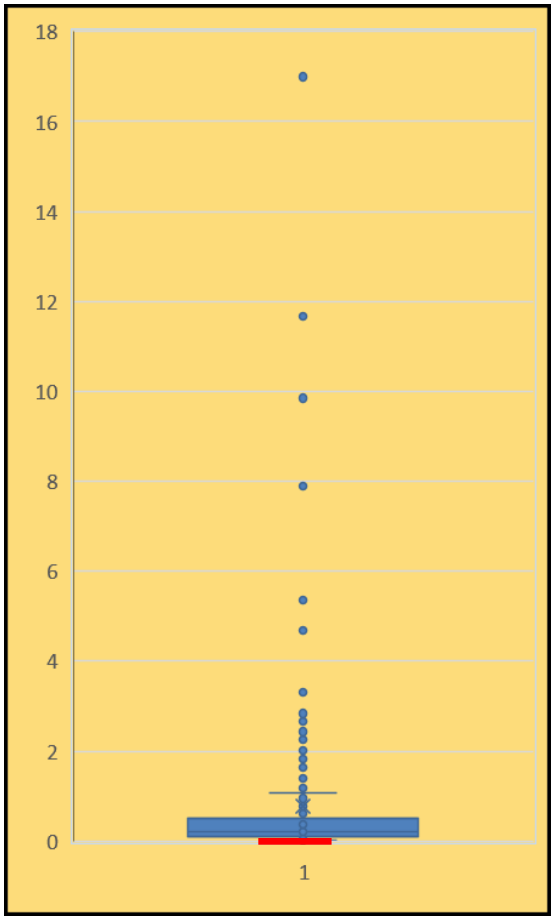
Sources:

Health Risks:

- Anemia
- Shortness of breath/cough
- CNS (headaches, dizziness, fatigue)
- Asthma
- Lower weight fetus
- Decreased blood clotting time
- Cognitive impairment

- RfC = 0.0012 ppb

1,2,4 Trimethylbenzene



Statistic:	Value (ppb)
Minimum	0.03
1st Quartile	0.09
Median—Indoor Outdoor	0.22 0.08
3rd Quartile	0.5
Maximum	17
RfC (red line)	0.0012
Number	170

1, 2, 4 Trimethylbenzene
N=183

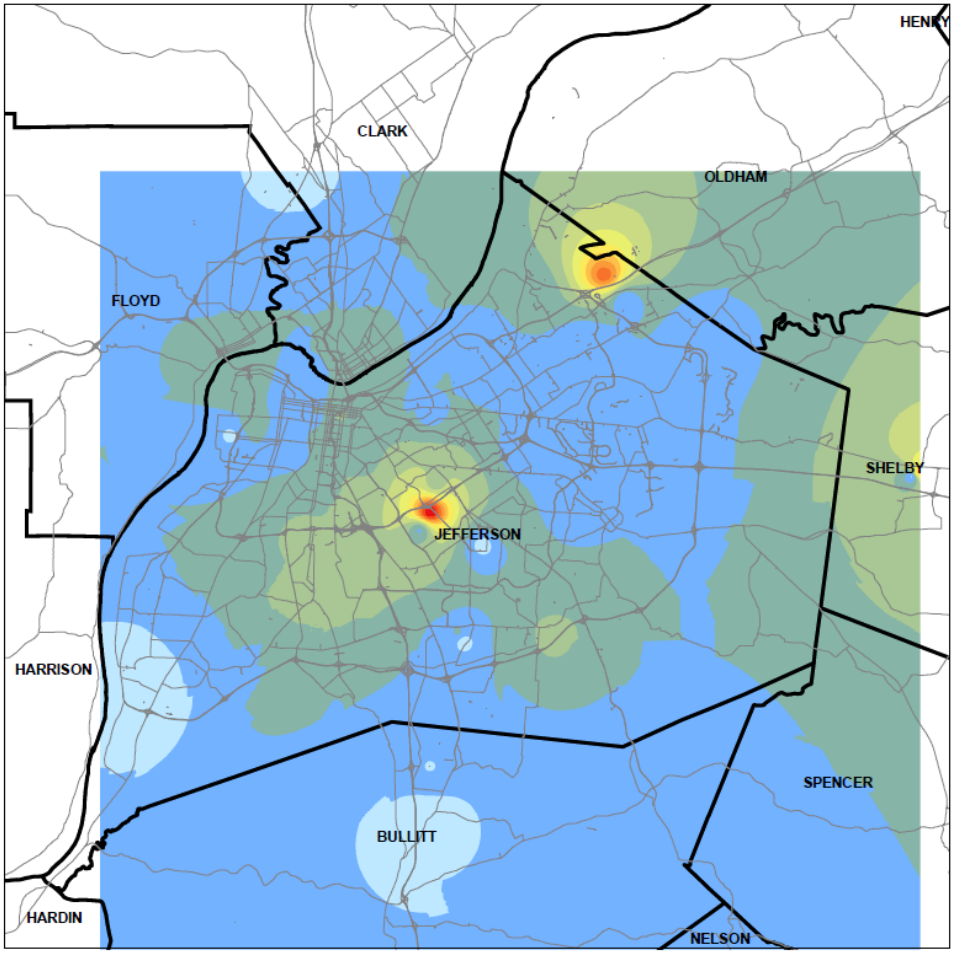


Figure 5. --1, 2, 4 Trimethylbenzene

Legend
Outdoor VOC in ppbv

0.02 - 0.16	0.88 - 1
0.17 - 0.3	1.1 - 1.2
0.31 - 0.45	1.3 - 1.3
0.46 - 0.59	1.4 - 1.4
0.6 - 0.73	1.5 - 1.6
0.74 - 0.87	1.7 - 1.7

Comparison of Rubbertown, Outdoor Air, Indoor Air

VOC	Rubbertown ppb (2012, Ralph Ave)	Outdoor Air ppb (2017-2019)	Indoor Air ppb (2017-2019)
Acetone	3.13	3.6	18.72
Acrolein	0.145	0.46	1.5
Benzene	0.2	0.14	0.26
Chloroform	0.075	0.03	0.19
Methylene Chloride	0.12	0.14	0.21
Toluene	1.815	0.18	1.83
Xylene m,p	0.255	0.11	0.62
1,2,4 Trimethylbenzene	0.08	0.08	0.09
Carbon Tetrachloride	0.09	0.08	0.09

Well this is all bad news. What can I do?

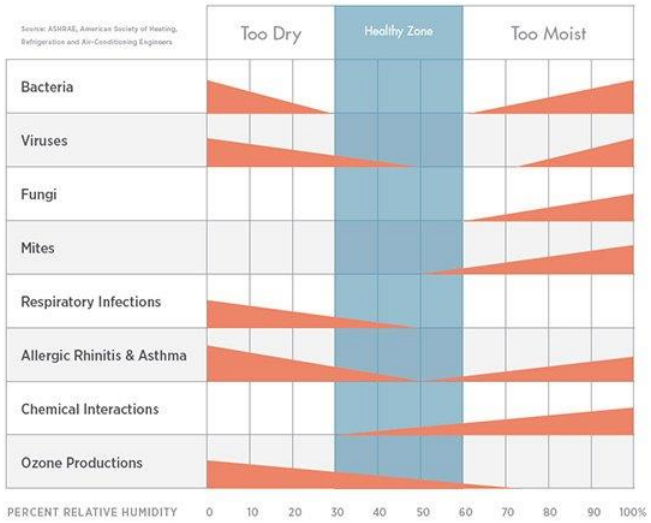
Test your Indoor Air

- Carbon dioxide
- Radon
- Humidity—30-55%

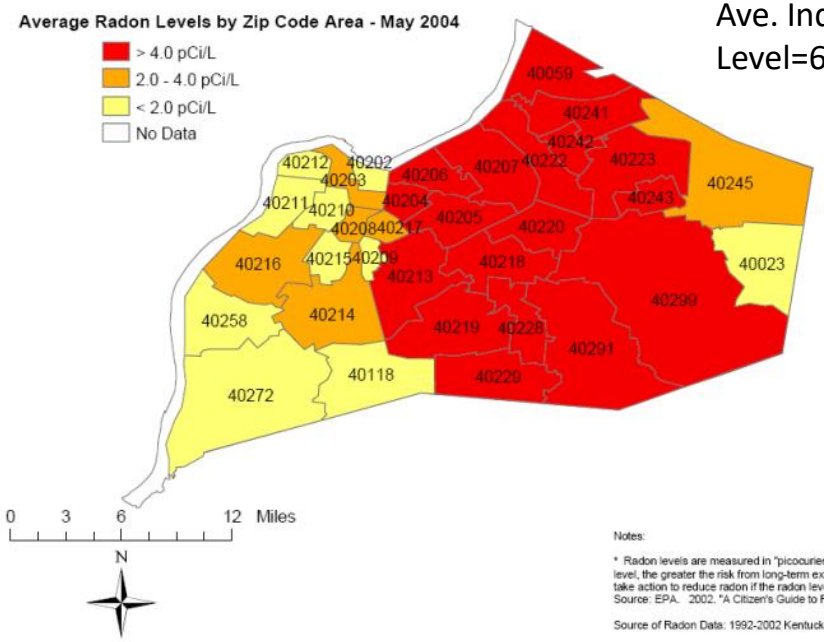
CO2 Concentrations	
250-350ppm	Normal background concentration in outdoor ambient air
350-1,000ppm	Concentrations typical of occupied indoor spaces with good air exchange
1,000-2,000ppm	Complaints of drowsiness and poor air.
2,000-5,000 ppm	Headaches, sleepiness and stagnant, stale, stuffy air. Poor concentration, loss of attention, increased heart rate and slight nausea may also be present.
5,000	Workplace exposure limit (as 8-hour TWA) in most jurisdictions.
>40,000 ppm	Exposure may lead to serious oxygen deprivation resulting in permanent brain damage, coma, even death.

Optimum relative humidity range for human comfort and health

(a decrease in bar height indicates a decrease in effect for each of the items)



Jefferson County Radon Zone Map



Ave. Indoor Level=6.5 pCi/L

Notes:

* Radon levels are measured in "picocuries per liter" or "pCi/L". The higher the level, the greater the risk from long-term exposure. EPA recommends that you take action to reduce radon if the radon level in your home is 4 pCi/L or higher. Source: EPA. 2002. "A Citizen's Guide to Radon".

Source of Radon Data: 1992-2002 Kentucky Radon Program

Source of GIS Data Layers: Kentucky Geological Survey

Actions To Take

- Ventilate home weekly
- Vacuum weekly, slowly with a HEPA filter/bag
- Replace furnace filters quarterly (MERV12+)
- Check exhaust fans in bathroom and kitchen to determine whether they vent outside. If yes, use them when cooking or showering. If not, they provide no benefit. Crack a window when cooking or showering.
- Do not store gasoline in your home or attached garage. If garage is heated, block vent into garage.
- When using liquid/aerosol chemicals, go outside.
- Minimize dust mites with pillow/mattress covers, wash sheets in hot water
- Prohibit smoking in your home
- Water-damaged carpets and building materials can harbor mold and bacteria
- Have central air handling systems, including furnaces, flues, and chimneys, inspected annually and promptly repair cracks or damaged parts.
- Throw away partially full containers of old or unneeded chemicals safely.

Buy smart

- Green your cleaners and disinfectants, e.g. vinegar, baking soda, lemon juice, salt and liquid castile soap all work
- Use low- or no-VOC paints
- Avoid fragrance products, they are never natural
- Never use aerosols indoors. Substitute with solids, liquids, or pump sprays
- Use carpets made of natural materials (cotton, wool, sisal, bamboo, etc.)
- If you have clothes dry cleaned, hang outside 2+ hours before bringing indoor
- Choose furniture without cloth upholstering or made with particle board. Look for Green Guard symbol
- Avoid buying laser printers for home use
- Plants such as broadleaf lady palm, lily turf, peace lily, spider plant, red-edged dracaena, and English Ivy will help lower VOC

Reference Materials

- Environmental Working Group's Skin Deep Cosmetics Database is an amazing resource to find out how your personal care products rate for health hazards. Over 75,000 products have been analyzed and given a score. www.ewg.org/skindeep/
- Environmental Working Group's Cleaners Database is an new resource that will be available in the fall of 2012. It will provide the same kind of analysis as the cosmetics database, only focusing on household cleaning supplies. www.ewg.org/guides/cleaners
- How to Grow Fresh Air: 50 House Plants that Purify Your Home or Office by B. C. Wolverton is a book written by the NASA scientist who did the research on the ability of plants to improve air quality.

Protecting Our Health

Socio-Ecologic Model

- Idea that there are steps to protect health and improve air quality can happen at all levels, from Government to Individuals.
  - Reduce Emissions
  - Reduce Exposure

Check out the Center For Health Equity's 2017 Health Equity Report to learn more about the socio-ecologic model and how it is used to recommend best practices for public health.

CENTER FOR HEALTH EQUITY
A Division of Public Health and Wellness

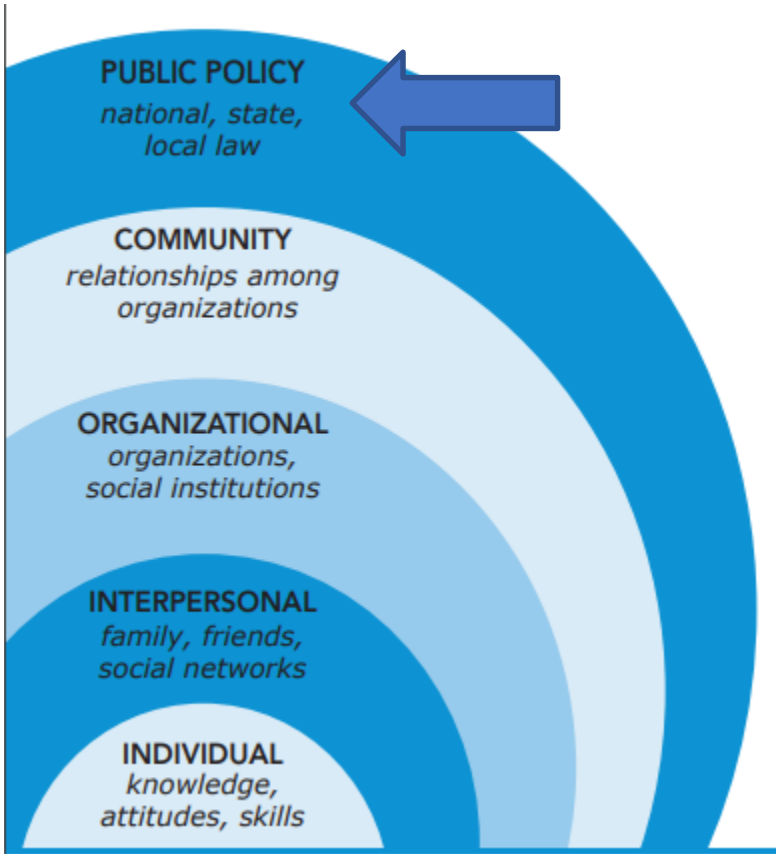
Public Policy

- Air Pollution Control District Regulations
  - Clean Air Act
  - Strategic Toxic Air Reduction (STAR) Program
  - Other local regulations

Workshop

PP

Public Policy

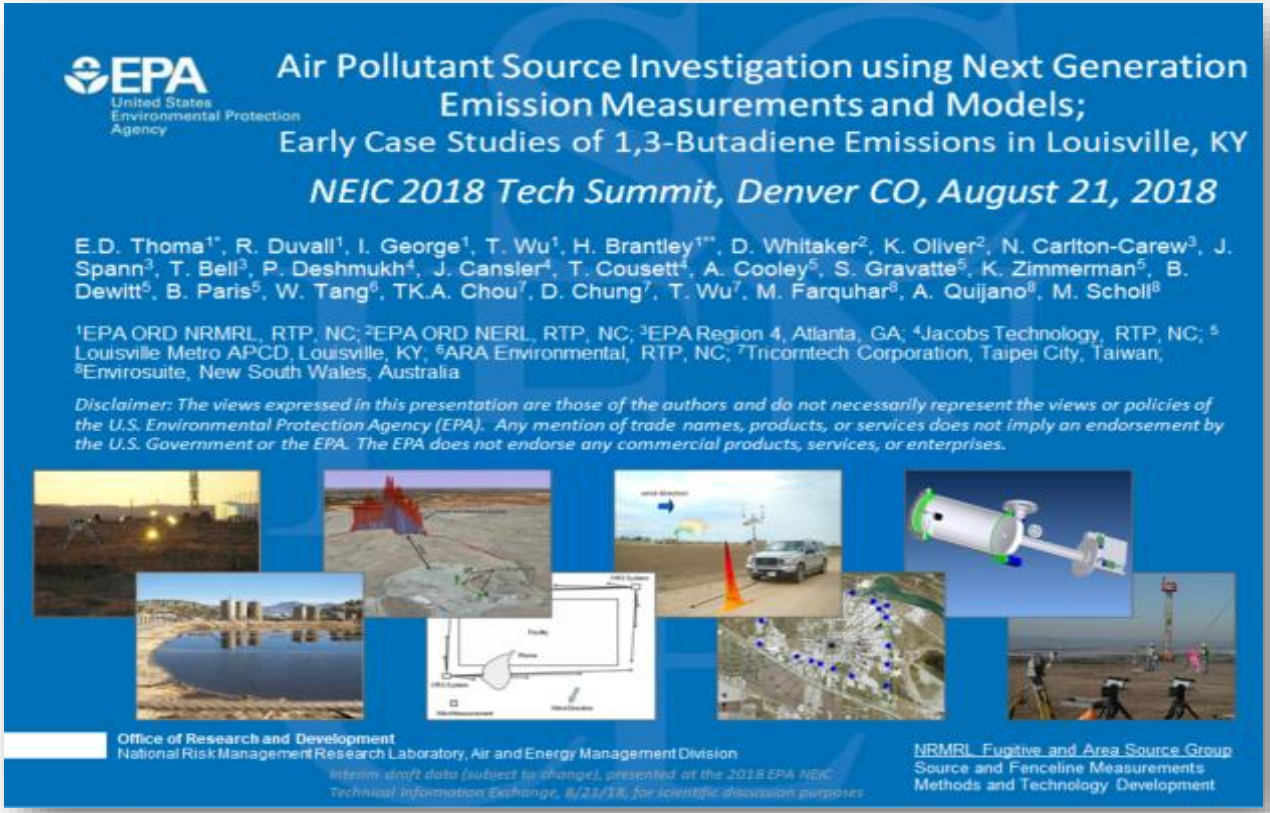


- Public Health and Wellness
  - Smoking Ordinance
  - Health Equity Report
- Office of Sustainability
  - Tree Protection Ordinance
- Develop Louisville
  - Comp Plan
  - Land Development Code
- KIPDA
  - Transportation Planning

Community

- Provide Air Quality info
  - Air Quality Alerts – local media (tv, print, radio)
  - APCD Website
  - AirNow
  - Louisville Air Watch
- Support local research and data gathering
  - UofL projects
  - Air Louisville
  - EPA RARE project

EPA Regional Applied Research Effort (RARE) Project



- Project tests Next Generation Emissions Measurement (NGEM) technology and models in Rubbertown

https://louisvilleky.gov/government/air-pollution-control-district/epa-air-toxics-monitoring-project-louisville

Community

- Tree Planting Projects

DIVISION OF COMMUNITY FORESTRY
Office of Sustainability – Louisville Forward

TREES LOUISVILLE

LOUISVILLE grows

- Cool Roof Rebate Program

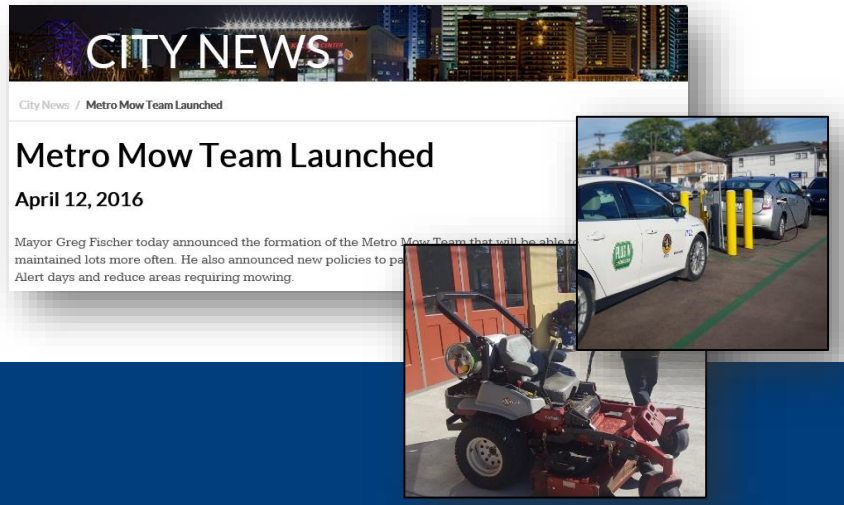
#cool502
GREENING | COOLING | CONSERVING

- Lead Safe Louisville
- Radon Testing Kits

Organizational

- JCPS Urban Heat Island Project
- Idle Free Schools
- Idle Free Businesses
- Greener Fleets
- Cleaner mowing

KENTUCKY CLEAN FUELS COALITION



Interpersonal

- Support family and friends trying to quit smoking
- Community bike rides
- Carpool/Vanpool
  - Ticket to Ride
- Share knowledge and best practices with your friends and family

Individual

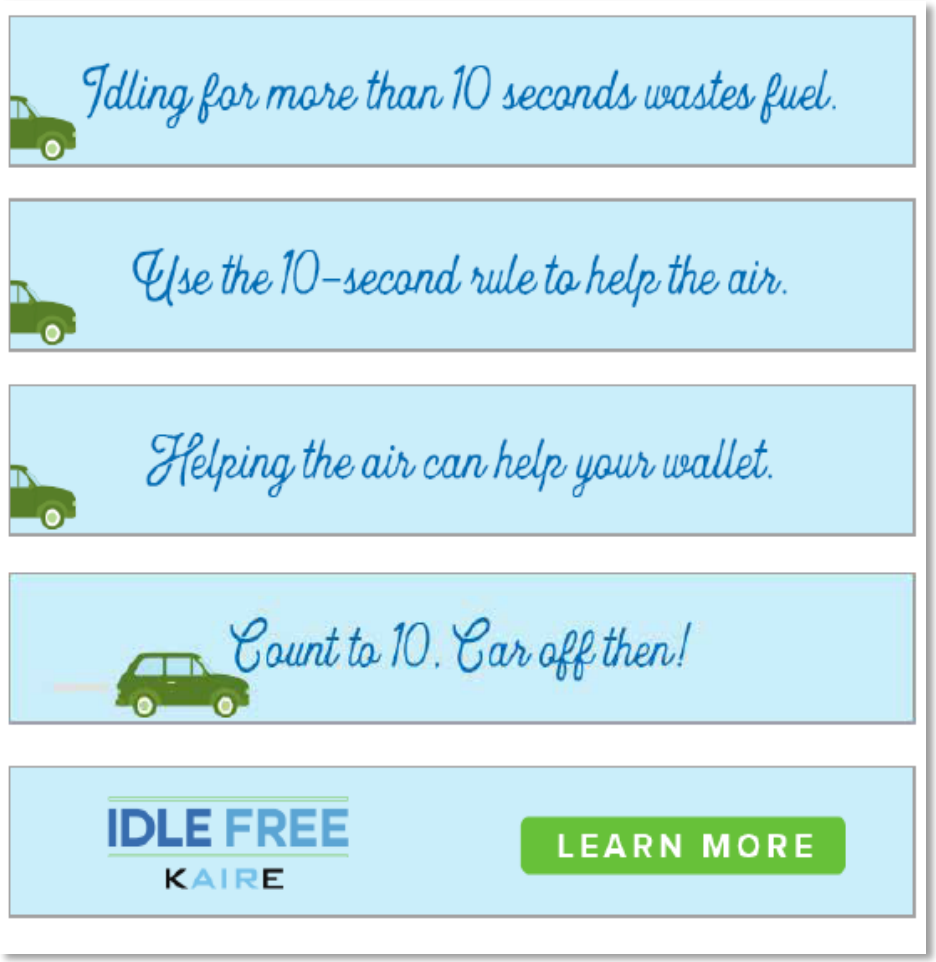
- Know the AQI
- Stop smoking
- Reduce use of household chemical
- APCD programs:
  - KAIRE, GMML and LCCA

KAIRE

- Kentuckiana Air Education (KAIRE)
  - Increases awareness of

the impact individual choices have on local air quality

  - Idle Free Program (businesses, schools, neighborhoods)
  - Encourages behavioral changes



Air Quality Alerts to protect everyone, esp. Sensitive Groups

Lawn Care for Cleaner Air

- One hour of mowing produces the same amount of pollution as driving your car for 200 miles
- The Lawn Care for Cleaner Air program offers rebates on cleaner, battery-powered equipment

Rebates Offered

String Trimmer

(min. 4 amp or 12-volt
+ 2-yr warranty)

$15 standard
$30 with trade-in

Mower Battery

(min. 20.5-volt)

$25 standard
$50 with trade-in

Electric Mower

(corded or cordless)

$50 standard
$100 with trade-in

Leaf Blower/Blower Vac

(min. 9 amp,
200 mph force
+ 2-yr warranty)

$15 standard
$30 with trade-in

String Trimmer/ Leaf Blower Battery

(min. 12-volt)

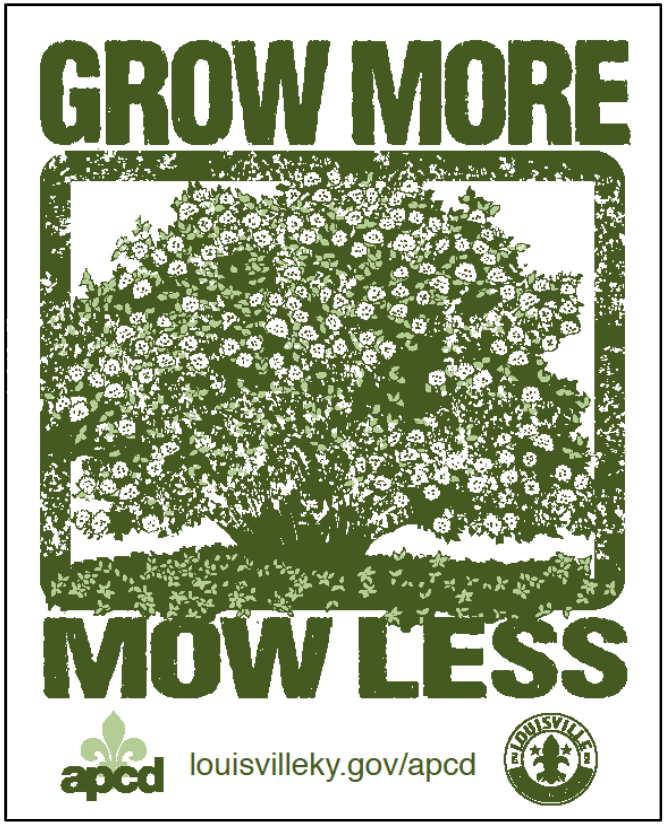
$10 standard
$15 with trade-in

Reel Mower

$25 standard
$50 with trade-in

Grow More Mow Less

- Sister program to LCCA
- Seeks to reduce turfgrass and replace with more sustainable, air-friendly landscaping
- Co-benefits: storm water management, reduction of urban heat, increased habitat for birds and beneficial insects



What other steps can we take to protect our health?

- Continue with education and outreach

- Collaborate and engage with community groups, local government, neighbors, schools and businesses to promote healthy air initiatives; create strong networks

Resources

Air Pollution Control District

Louisvilleky.gov/APCD

Air Quality Updates

Louisvilleky.gov/airquality

Airnow.gov

Environmental Protection Agency (EPA)

EPA.gov

EPA.gov/Region4

EPA.gov/indoor-air-quality-iaq

Kentucky Division of Air Quality

Air.ky.gov

KAIRE

Helptheair.org

Facebook.com/helptheair

Twitter.com/helptheair

Lawn Care for Cleaner Air

Louisvilleky.gov/government/lawn-care-cleaner-air

Grow More Mow Less

Facebook.com/GrowMoreMowLess

Call APCD at (502) 574-6000

Resources

Louisville Metro Department of Health and Wellness

louisvilleky.gov/government/health-wellness

Centers for Disease Control and Prevention

cdc.gov/air/air_health.htm

World Health Organization

who.int/airpollution/en/

Consumer Product Safety Commission

cpsc.gov/Safety-Education/Safety-Guides/Home/The-Inside-Story-A-Guide-to-Indoor-Air-Quality

American Lung Association

lung.org/about-us/local-associations/kentucky.html

Kentucky African Americans Against Cancer

National Institute of Environmental Health Sciences

niehs.nih.gov/health/topics/agents/air-pollution/index.cfm

Pollen forecasts

weather.com; pollen.com; accuweather.com

Reference Materials

Environmental Working Group's Skin Deep Cosmetics Database is an amazing resource to find out how your personal care products rate for health hazards. Over 75,000 products have been analyzed and given a score. www.ewg.org/skindeep/

Environmental Working Group's Cleaners Database is an new resource that will be available in the fall of 2012. It will provide the same kind of analysis as the cosmetics database, only focusing on household cleaning supplies. www.ewg.org/guides/cleaners

How to Grow Fresh Air: 50 House Plants that Purify Your Home or Office by B. C. Wolverton is a book written by the NASA scientist who did the research on the ability of plants to improve air quality.

Questions?

Louisville Metro
Air Pollution Control District

701 W. Ormsby Ave.
Ste. 303
Louisville, Ky. 40203

(502) 574-6000
www.louisvilleky.gov/APCD

Keith H. Talley Sr., Director